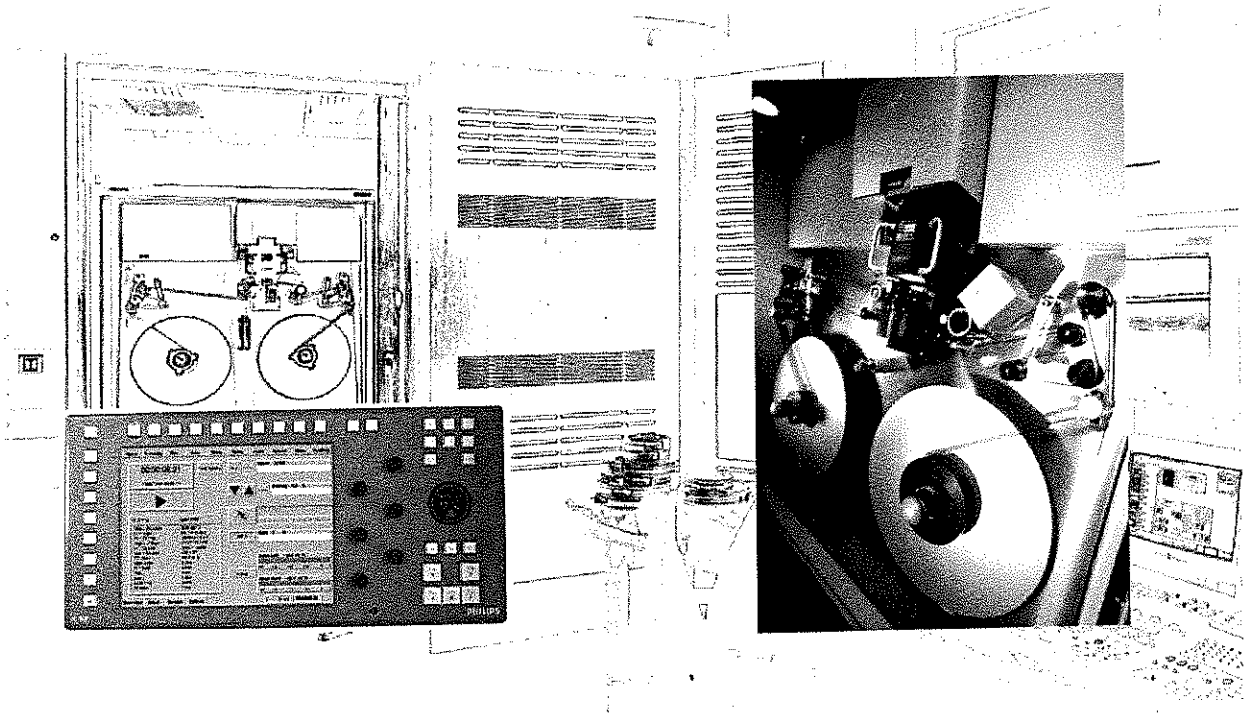
Spirit DataCine® Filmscanner

SDC 2002



Customer's Manual

Operating Instructions
Planning & Installation
Operating Software 4.60

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

Published by

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

BTS Media Solutions GmbH

Brunnenweg 9
D-64331 Weiterstadt, Germany
P.O. Box 1165

Tel: +49 (0) 6155-870-0
Fax: +49 (0) 6155-870-300

Web Sites
Internet: www.thomsonbroadcast.com
www.imagingsystems.de
Intranet: www.weiterstadt.thmulti.com

Trademarks

All product names mentioned in this manual are the trademarks of their respective owners.

Copyrights

Information in this document is subject to change without notice.
This document and any updates and/or supplemental information, including any copies thereof, cannot be reproduced, neither communicated to a third party, without written authorization from **THOMSON multimedia Broadcast Solutions.**

Please notify THOMSON multimedia Broadcast Solutions of any errors in this document. We also would appreciate any comments you have to improve this manual.

© BTS Media Solutions GmbH 2002. All rights reserved.

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

Revision Report

Spirit DataCine Film Scanner SDC 2002

Customer's Manual

Documentation Order Number FU 0120 / 0 126 632 000

Before reading the entire manual, please check for any supplements at the end of the manual.

Item	Rev.	Date	Serial No.	Pages affected	Contents	Remarks
1	0	December 2002	2201		Spirit DataCine Film Scanner SDC 20002	
					Operating Instructions	Op. SW V4.60
					Planning & Installation	Op. SW V4.60
					Customer's Manual Graphical Control Panel	3rd Edition Op. SW 1.6

SAFETY INSTRUCTIONS

CAUTION!

Servicing

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any installations other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Ultraviolet Radiation

Caution!
High-intensity ultraviolet energy exists within the illumination path, generated by the Xenon arc projection lamp. Protect eyes and skin.

Class 1
LASER PRODUCT
Eye-safe

Safety instruction concerning FH 6335 HIPPI Serial Interface:

The laser transceiver, used in this unit, is classified as AEL Class 1 (U.S. 21 CFR(J) and /AEL Class 1 per EN 60825-1 (+A11) and is eye safe.

High Voltages

Power supply in excess of 40 volts are potentially hazards or lethal.

Supplies of up to 25 kV (Ignition Xenon Lamp) exist within the film scanner.

At no time should contact be made with the machine wiring or terminals, except via a probe with appropriate insulating properties.

Danger of Fire

Caution!
Mount the film scanner on concrete or other non-combustible surface only.

E184475

This Spirit Datacine film scanner Model SDC 2002 (three phase 120/208V AC Power version) is designed according to regulations of the Underwriters Laboratories Inc. ® Northbrook, Illinois US, certificated in July 1997 and registered as file no. E184475.

All SDC 2002, operating on the mains voltage 120/280V AC, are constructed in conformity with the American and Canadian UL standard and are marked with an UL sign on their type label.

Conform with the following European directives and CE marked.

Safety:	Low voltage directive 73/23/EEC, EN 60950 / 1997
EMC / EMI:	EMC directive 89/336/EEC Interference emission EN 55103-1 / 1996 Interference immunity EN 55103-2 / 1996

N4067

EMC: AS/NZS 3548

FCC 47 Part 15 Class A

FCC Rules 47 Part 15 Sec 15.105

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Nitrate film material

The Spirit DataCine film scanner is not designed for running nitrate film material. Thomson is not responsible for possible damage to the film material as well as for any subsequent damage resulting therefrom.

Nitrate-base film material can be destroyed through electrostatic effects or when the internal heat filter is damaged.

Risk of injury

When the film scanner is running, always keep the front doors closed, do not touch the rotating film deck parts.

The closed front doors protect against fluttering film ends in the event of a film break.

Operation

During operation, the filmdeck front doors are secured with an automatic locking mechanism:

Front doors open	**Film operation up to a fixed speed of maximally 50 frames per second is possible**
Front doors closed	**All operation modes are possible**
Front doors locked	**At more than 2x the standard speed , closed front doors are locked additionally. The front doors are unlocked as soon as lower shuttle speed is reached again.**

During operation

Operate the film scanner in the closed condition only.

Closed machine door

To avoid EMC (electromagnetic compatibility) problems keep the SDC 2001 rear doors always closed during operation.

External connection cables

All external connection cables have to be led through the "Cable feed-through panel", located at the rear of the film scanner, and their cable shields have to be connected to the ground by means of the earthing clamps or the sealing tape. For details, see chapter 5 of "Planning & Installation" in this manual.

Opening the covers or removing parts with tools may give access to live parts. In such cases, the machine has to be disconnected from the mains.

If, for example due to a failure, safe operation of the film scanner is no longer ensured, take the machine out of operation and secure it against further use.

Do not insert or remove plug-in cards during operation.

Access to the Inside

Access to the inside of the film scanner is restricted by locked front and rear doors.

The closed doors protect the operator against electrical and mechanical hazards.

Before working on the power supply circuit (power clips, wires, filters, switches, fuses etc.) do disconnect the filmscanner from mains. Even if the mains switch is "OFF", the parts of the device are still alive!

If, however, working on the opened machine is inevitable, this has only to be done by an expert who is familiar with the dangers involved.

Caution!
Capacitors may still carry a residual charge for approx. 4 minutes after having switched off the device!

Safety regulations AC power supply

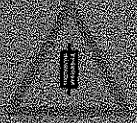
The film scanner is designed in conformity with the safety regulations EN 60950 / VDE 0805 (protection class 1) and is in a faultless condition when leaving the factory.

In order to maintain this condition and to ensure safe operation, the following directions have to be observed!

Earthing

When setting up and connecting the film scanner, connect the earth line **always** before connecting the power line.
Thus is ensured that in case of a short-circuit between mains and case, the current is led to earth.
For this reason, **never** disconnect the earth line from the device while it is operated. Details see chapter *4.x* "Earthing Requirements".

Fuses



The film scanner is protected by primary side fuses located on the power terminal unit.

Caution!
To reduce the risk of fire replace only with the same type and rating of fuse.
Never use a mended fuse! Do not short-circuit the fuse holder!

Caution!
The rear service AC Out socket is a double-pole neutral fusing. After operation (breaking) of the protective device, one line can remain under voltage!

Mains voltage

The film scanner is set to operate at the mains voltage stated on the label on the machine rear.

Prior to the installation of the machine, make sure that the mains voltage in the studio is identical to the voltage stated on this label!
Details see chapter "Mains connection" in the manual "Planning & Installation".

Ventilation

The film scanner is cooled by a ventilation system on the upper side of the film scanner, and from below through openings in the bottom frame. For cooling reasons always keep the doors closed during operation.

For this reason, make sure that this air inlet is not covered when setting up and that sufficient space is kept to the other units.

The admissible ambient temperature range of the film scanner is within +10° C and +35° C.

Make sure that the machine is protected against high humidity!

Make sure that enough space is provided so that the film scanner is easily accessible for operation and service works.

FCP Display

The protection glass of the display on the Functional Control Panel CP1 is not scratch-proof and not shock-proof. In order to prevent the risk of injury, take care that no parts drop on the display. Please replace a damaged display immediately!

Batteries

The device contains lithium batteries, which have to be exchanged every five years. Detailed information you can find in the section *Change the backup batteries* in the operation manual.

Caution!
Danger of explosion if battery is incorrectly replaced (interchanged poles).
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose used batteries according to the manufacturers instructions.

Protect the environment!
Dead batteries do not belong in the garbage. Hand the used batteries over to a local disposal place!

Projector and exciter lamps

Do not reach into the lamp house during operation.
Change a defective lamp only when it has cooled down for 30 minutes (risk of getting burnt).

Stability

Secure the film scanner against **sliding**.
Loosen off the 4 screwed stand feet of the film scanner using a 17 mm wrench, until the transport wheels are released.

Connection cables

The EMV regulations are only applicable when correctly shielded cables are used for installation of the equipment. This applies to video cables as well as control cables. Corresponding cables can be obtained from Thomson.
Run all connection cables in covered cable ducts (risk of stumbling).

Konformitätserklärung
Declaration of conformity

Wir
We

BTS Media Solutions GmbH
Business Unit Film Imaging Products
Brunnenweg 9
D-64331 Weiterstadt
Germany

erklären in alleiniger Verantwortung, daß das Produkt
declare under our sole responsibility that the product

SPIRIT DataCine	**Type SDC 2002**

mit den Optionen / *with the Options*:

Functional Control Panel	**Type CP 1**
Audio Output Transformer	**Type FY 1102**
Audio Pickup and Processing	**Type FH 1129**
Rotation	**Type FH 1674**
HDTV	**Type FH 1675**
Data Output Interface	**Type FH 1676**
Hippi Serial Interface	**Type FH 6335**
6 Sector Color Processeor	**Type 6 SC-SDC**
GSN Data Output Interface	**Type TE 2111**
Super 8mm Scanning	**Type FH 6603**

auf das sich diese Erklärung bezieht, mit folgenden Normen übereinstimmt:
to which this declaration relates is in conformity with the following standards:

EN 55103-1 /1996
EN 55103-2 /1996

EN 60950 /1997

entsprechend den Bestimmungen der Richtlinien 89/336/EWG und 73/23/EWG.
following the provisions of 89/336/EEC and 73/23/EEC directives.

Jean Michel Dupont

Weiterstadt,den 18.12.2002
.....
(Ort und Datum der Ausstellung)
(place and date of issue)

.....
(Rechtsgültige Unterschrift)
(legal signature)

Quality Support: (Wolfgang Lerch) .....

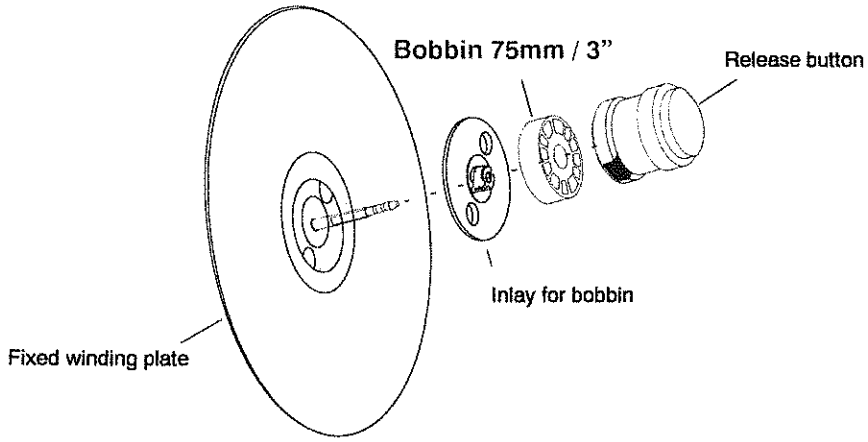
IMPORTANT NOTE!

Spirit DataCine
SDC 2001

Capstan & Sprocket Pulse Generator FY 6202 / 6272 & FY 6222 / 6262

When using

- **Film rolls or reels up to 2.8 inches or with more than 17 inches diameters**
  the ballistic of the filmdeck is changed. That means editing operation with the default telecine controller parameters is not accurate. We recommend to use 3 inches bobbins for film rolls.



Wichtiger Hinweis!

Capstan Ctrl. & Sprocket Pulse Generator FY 6202 / 6272 und FY 6222 / 6262

Bei Verwendung von

- **Filmrollen oder Filmspulen bis 70 mm oder mit mehr als 440 mm Durchmessern**
  ist die Ballistik des Filmlaufwerks so verändert, dass ein korrekter Schnittbetrieb mit den Standardparametern des Telecine -Controllers nicht möglich ist. Wir empfehlen für Filmrollen 75 mm Bobbins zu verwenden.

IMPORTANT NOTE!

When using

bobbins with diameters of 2 inches (50mm)

an undesired film stop is possible during high speed shuttle operation near the end of the film!

For that reason Thomson Multimedia recommends to use 75mm bobbins.

WICHTIGER HINWEIS!

Beim Verwenden von

50mm-Filmkernen (Bobbins)

kann es beim schnellen Umspulen nahe des Filmendes zu einem ungewollten Film-Stop kommen!

Thomson Multimedia empfiehlt deshalb 75mm-Filmkerne zu verwenden.

ATTENTION!

The Spirit DataCine film scanner unit weights approx. 1314 lbs!

The film scanner unit has to be unpacked and lifted up by authorized forwarding agencies only, with appropriate lifting tool under control and instruction of Thomson Multimadia service personnel!

Details for unpacking, lifting up and installing the film scanner are contained in the customer's manual.
The customer's manual is delivered in a separate transport case with the accessories.

ACHTUNG!

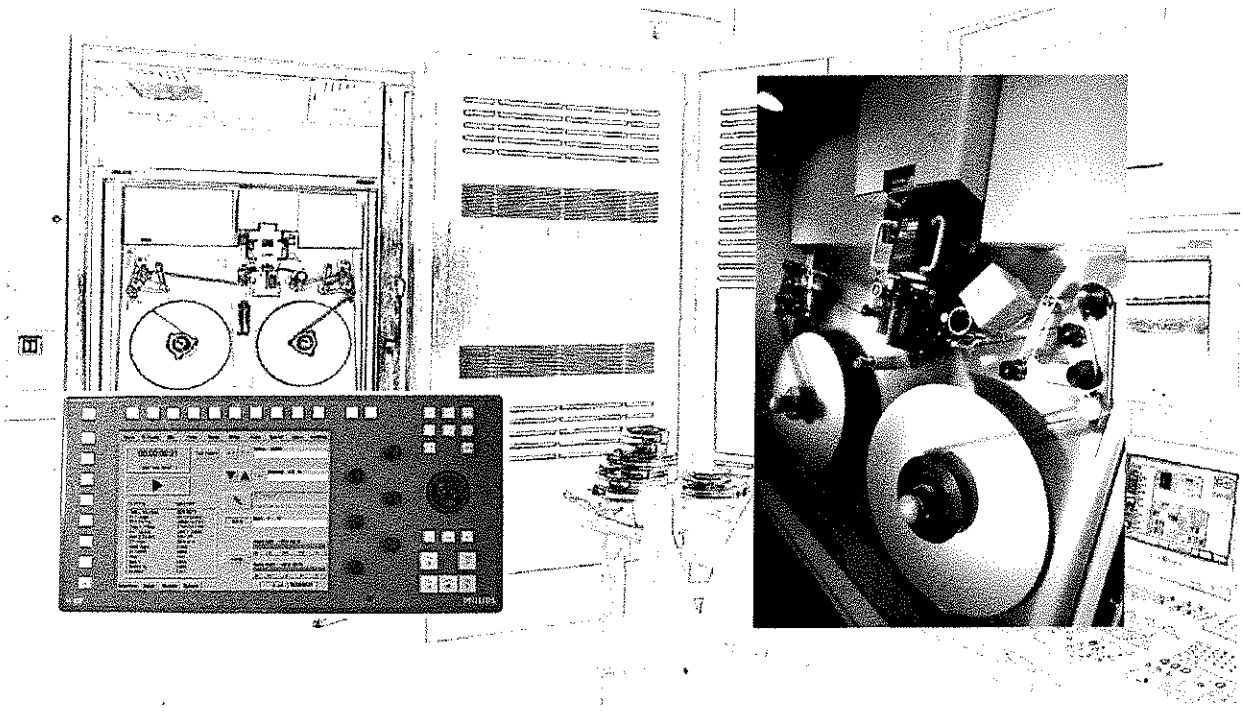
Der Spirit DataCine Filmabtaster hat ein Gewicht von ca. 595 kg!

Der Filmabtaster darf nur von autorisierten Speditionen mit geeignetem Hebewerkzeug, unter Aufsicht und Weisung von Thomson Multimedia Servicepersonal, ausgepackt und aufgestellt werden!

Detaillierte Hinweise zum Auspacken, Aufstellen und Inbetriebnahme des Filmabtasters sind im Kundenmanual enthalten.
Das Kundenmanual wird in einer separaten Transportkiste gemeinsam mit dem Zubehör geliefert.

Spirit DataCine® Filmscanner

SDC 2002



Planning & Installation

GCP controlled
Prepared for S8mm Film Scanning
Free programmable LUT for Data Output
Reference Store
Prepared for GSN Interfacing
Operating Software V4.60

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

Published by

BTS Media Solutions GmbH

Brunnenweg 9
D-64331 Weiterstadt, Germany
P.O. Box 1165

Tel: +49 (0) 6155-870-0
Fax: +49 (0) 6155-870-300

Web Sites
Internet: www.thomsonbroadcast.com
www.imagingsystems.de
Intranet: www.weiterstadt.thmulti.com

Trademarks

All product names mentioned in this manual are the trademarks of their respective owners.

Copyrights

Information in this document is subject to change without notice.
This document and any updates and/or supplemental information, including any copies thereof, cannot be reproduced, neither communicated to a third party, without written authorization from **THOMSON multimedia Broadcast Solutions**.

Please notify THOMSON multimedia Broadcast Solutions of any errors in this document. We also would appreciate any comments you have to improve this manual.

© BTS Media Solutions GmbH 2002. All rights reserved.

CONTENTS

		Page
1.	**General**	**1-1**
	About this Manual	1-1
	Safety Instructions	1-1
1.1	Introduction	1-2
1.2	Features	1-3
1.3	Overview	1-13
1.3.1	Operational Units	1-13
1.3.2	Options	1-14
1.3.3.	Video Blockdiagram	1-17
1.3.4	Theory of Operation	1-19
1.3.4.1	Rack 1	1-21
1.3.4.2.	Audio Blockdiagram	1-27
1.3.4.3	Rack 2	1-29
1.3.4.4	Rack 3	1-34
1.3.4.5	Motor Servo System	1-46
1.3.4.6	Control Panels	1-48
1.3.4.7	Control Systems	1-52
2.	**Specifications**	**2-1**
2.1	General	2-1
2.2	Film Transport System	2-4
2.3	Illumination & Film Scanning System	2.3
2.4	Video	2-7
2.5	Control System	2-9
2.6	Waveform Monitoring	2-10
2.7	I / O Interfaces	2-11
2.8	Options	2-13
2.8.1	Audio	2-13
2.8.2	Data Output HiPPI I.F.	2-15
2.8.3	GSN Data Output Spirit DataCine	2-16
2.8.6	Rotation	2-19
2.8.7	HDTV	2-19
2.8.8	DTV	2-20
2.8.9	Vistavision	2-20
2.8.10	Steadiscan	2-21
2.8.11	6 Sector Color Processor	2-22
2.8.12	S8mm Film Sanning	2-23

1th Edition,
FU 0120 / Customer's Manual 0 126 632 000 Part 2 (UL & CE version)

3. System Applications **3.**

3.1. Film to Tape SDTV/Pogle Pandora & VS4 3-3
3.2. Film to Tape SDTV/Pogle Pandora/Scream & PTE 3-4
3.3. Steadiscan/Film to Tape SDTV/Pogle Pandora & VS4 3-5
3.4. Steadiscan/Film to Tape SDTV/Pogle Pandora/Scream & PTE 3-6
3.5. Film to Tape SDTV/DaVinci Renaissance & VS4 3-7
3.6. Film to Tape SDTV/ DaVinci Renaissance/Scream & PTE 3-8
3.7. Film to Tape SDTV/Pandora MegaDef/Scream & PTE 3-9
3.8. Film to Tape DTV/DaVinci 2K & VS4 3-10
3.9. Film to Tape DTV/DaVinci 2K & Scream & PTE 3-11
3.10. Film to Tape HDTV/DaVinci 2K & PTE 3-12
3.11. Film to Tape HDTV/Pogle Pandora/MegaDef & Scream 3-13
3.13. Waveform monitoring 3-15
3.14. Keycodereader Application Evertz 3-16
3.15. Keycodereader Application Aaton 3-17
3.16. Keycodereader Application Arri 3-18
3.12. GSN TransferEngine Application 3-14

4. Installation **4-1**

4.1 Unpacking 4-2
4.2 Space Requirements and Environmental Conditions 4-5
4.3 Installing Local Control Panel 4-8
4.4 Installing Handles to the Front Doors 4-8
4.5 Installing Functional Control Panel 4-9
4.6 Removing Locking Devices and Styrofoam Elements of the Filmdeck 4-12
4.7 Removing Styrofoam Elements of AIH 4-13
4.8 Insert Lenses, Filters and Xenon Lamp 4-16
4.9 Installing Lens Gate Assembly LGA 4-21
4.10 Installation of Keycode Readers 4-22
4.11 Connecting an external Gateblast Air Compressor 4-41
4.12 AC Power (Mains Voltage) Connection General 4-43
4.13 Earthing Requirements 4-47
4.14 Mains Systems 4-49
4.15 Find out Type of Mains System 4-51
4.16 Required Cable Cross Sections 4-54
4.17 Installation of the Power Cord 4-55
4.18 Fuses 4-58

5. Connection of External Equipment **5-1**

5.1 EMC Terminal Panel with Cable Feed Throug 5-1
5.2 Overview Rack 1 - 3 5-3
5.3 Connection Unit Audio Rack 1 5-4
5.4 Connection Unit Rack 2 5-8
5.5 Connection Unit Rack 3 5-27
5.6 IMCS Connections (RJ45) 5-44

6.. Control & Display Elements **6-1**

6.1 Rack 1 6-1
6.2 Rack 2 6-7
6.3 Rack 3 6-20

7. First Steps **7-1**

8. Basic Operation **8-1**

9. Trouble Shouting **9-1**

10. Interfaces **10-1**

10.1 RJ 45 / IMCS 10-2
10.2 Data Output Interface (HIPPI / GSN) 10-3

11. Index **11-1**

1. GENERAL

About this Manual

Planning & Installation is part two in a set of two parts of the Customer's Manual.

This part informs the user about the Spirit DataCine Film Scanner features, basic operation, specifications, installation, system applications, startup procedure and pin assignment of various interfaces.

Trademarks

All brand and product names are trademarks of their respective companies. Technical information in this document is subject to change without notice.

1.1 INTRODUCTION

The **Spirit DataCine Film Scanner** is a professional digital multi-standard telecine based on highly sophisticated CCD film scanning technology, for reproduction of color and black/white films of the most different formats in highest picture quality.

Spirit DataCine Film Scanner SDC 2002

Fig. 100: SDC 2002

The unit is equipped with a high-resolution Kodak Advanced Imaging Head (AIH), the electronic for film pre- and postprocessing and a keycode reader mounting support. The operating software serves to set the video parameters by means of the primary color correction in extended ranges. The film scanner is prepared for various useful options like **Rotation**, **Steadiscan, HDTV Output, Data Output via Phantom Transfer Engine, 6/8 perf film mode Vistavision**and a **6-Sector Color Correction**. These features make the film scanner predestined for high-end postproductions.

Extended flexibility provided by the options mentioned above gives the film scanner a definite lead in telecine technology.

1.2 FEATURES, SPECIAL CHARACTERISTICS

Principle of film scanning

A prism assembly splits up the line of the light scanning film onto the respective color filters of the R G B line CCD sensor and onto a quad, quarter-line CCD sensor providing the high-resolution detail signal.
The impinging light is optoelectrically converted into pixel elements of the CCD line sensor depending on the line content, then transferred in parallel to the analog CCD shift register and read out horizontally.

Output standards

The film scanner provides for reproduction of films in the 625/50 and 525/59.94 (4:3 / 16:9) SDTV standards and - as optional feature - in the various HDTV standards (1280x720 / 1920x1080 - interlaced 2:1, progressive 1:1, segmented frame) or in DPX film data format. EDTV standards are prepared.

Film types

COLOR PRINT (B/W positive, B/W negative, color positive), **COLOR NEGATIVE**, **INTERMEDIATE*** and **PRIMETIME** films of all formats can be reproduced, which have 1 (16 mm) 2, 3, 4 (35 mm) perforation holes per frame.

The option "Vistavision" provides the reproduction of 6 and 8-perf films.

* Intermediate film: a normal positive film with an orange colored mask which is also used in negative films.

Film formats

The film scanner operates with S8 (option),16mm, Super 16mm, Academy 35mm and Full Aperture -35mm film formats. A simple switch-over enables 4:3 as well as 16:9 reproduction.

Format change

Format change from 35mm to other film formats without the need of adjustments, simply by menu selection and exchanging the lens gate assembly.

To operate standard films with optical sound track areas by using full aperture lens gate assembly, it is recommended to replace the film gate block by a corresponding film gate block with a smaller illumination aperture.

Lens gate assemblies

The film scanner can be equipped with the following lens gate assemblies (also called LGA):

- Super 16mm lens gate assembly plus Gate Block FSB S16 GB or FSB 16 GB (Is also used for S8 films by means of optional adapters)

- FA 35mm lens gate assembly (Full Aperture) plus Gate Block FSB FA 35 GB or FSB 35GB

Effect filter

The Effect Filter device facilitates the usage of optical effect filters for the Spirit DataCine film scanner. It consists of a prepared LGA and a selection of drawers which position filters in the optical path between the projection lens and the CCD sensors.

Gateblast unit - strongly recommended

An integrated gateblast unit consisting of a pressure reducer, air filter and magnetic valve keeps the light gap and the integration cylinder of the film gate dustfree.
An external air compressor (approx. 2.5 - 7.5 bar or 35 - 100 lb / sq. inch - air volume: 40 l / min. / oilfree operating) is required.

Attention!
The using of the gateblast unit is strongly recommended to keep the film gate with illumination slit and integration cylinder clean from dust.

Sizing

The fully digitized sizing facility allows a distortion-free reproduction of different film formats.
Broadcast quality picture section enlargements and reductions are possible via the sizing adjustments.

Primary color correction

Via stored matrix and mask settings, all positive, negative and interpositive films are adapted to the film scanner.

Color correction adjustments can be carried out individually or together in the black, gray and white picture areas.

The chrominance saturation compensates color losses of the film being scanned.

Secondary color correction

SDC 2002 is prepared for the option "6-Sector Color Correction".

Aperture 2D contour correction

The horizontal and vertical contour and aperture enhancement of the film scanner provides optimum sharpness.

Film reels or winding plates

The film capacity of winding plates (Ø = 44 cm) amounts to 900 m and of film reels (Ø = 54 cm) to 1200 m.
In addition, film loop operation is possible.

Film transport

The film transport is made continuously. The silent capstan drive is microcomputer-controlled and ensures gentle film handling.

Film transport modes

There are **two unlocked modes** of film transport in forward and reverse motion:

1. Single frame mode

2. Continuously adjustable search mode
   with visible picture and full color picture size)
   from slow motion (= 1/10 of normal speed)
   at least 3 times the normal speed for 35mm film to 10 times of normal speed
   at least 6 times the normal speed for 16mm film to 25 times of normal speed

Locked modes

Normal speeds are:

24 frames/s	for 60 Hz TV standards
25 frames/s	for 50 Hz TV standards

Fixed film transport speeds (forward and reverse):
with 50 Hz standard: 6 1/4, 12 1/2, 25 and 50 fps
and with 60 Hz standard: 6, 12, 18, 24, 30 and 48 fps

Variable SAS (select a speed) film transport speeds forward and reverse:
are from 2 to 57 fps.

In addition, quick stop and a high-grade freeze frame are standard.

Auto functions

The film scanner has an **automatic quick stop mode** that responds to film break and film run out.

The **FPN (Fixed Pattern Noise) correction**: includes the automatic shading compensation, the automatic white balance and the coarse POS/NEG matching.

The **automatic iris control** can adjust the film illumination intensity for 3 f-stops within 42 ms.

Analog video interface

Analog R G B or Y C_B C_R standard video interface (SDTV Output FY 6312) enables connection to conventional video equipment.

Digital video interface

The digital video interface (SDTV Output FY 6312) provides SDTV 4:2:2 output signals conforming to EBU Tech. 3267-E and SMPTE 125 M interface format and to the CCIR 601 and CCIR 656 standards.

- Digital Outputs:
  - SDTV 4:2:2, 4:2:2:4 or 4x4 Parallel
  - SDTV 4:2:2, 4:2:2:4 or 4x4 Serial

Distribution of EDTV and 8:4:4 signals via this interface is prepared.

Sepmag control interface

This interface can be used to drive external SEPMAG units (e.g. Killi, Albrecht, Sondor, Perfectone a.o.) lip-synchronously to the associated film.
Two bi-phase sync pulses determine the direction of tape motion of the external SEPMAG unit.
These pulses are configurable to 1x (25/24 Hz) 2x (50/48 Hz) or 10x (250/240 Hz) the film speed.

Time code system

The film scanner enables a clear identification of every frame at any PLAY speed. Linear Time Code compatible to SMPTE standard 12M is provided at socket LTC OUT Rack3.

Key code reader systems

The "Keycode Reader Mounting Support" provides the use of AATON, Evertz and ARRI keycode reader heads and is now standard on the SDC 2002.

Note!
Reader heads and encoders are not included.

Key code embedded in DPX data

The operating procedure applies to keycode data reproduction generated by a keycode reader from the manufacturers Evertz or AATON.

Local Control systems

The film scanner is supplied with the Local Control Panel which provides basic operation of transport, framing, FPN, stand-by and local / remote functions.
The Functional Control Panel provides complete functional control of the film scanner, incl. setups. This panel controls the machine via the internal **iMCS 1** interface.

Remote control interfaces

The remote control interface **iMCS 1** serves also to remotely control the film scanner from external devices (e.g. Pogle Pandora, DaVinci Renaissance).

IMCS control interface

The iMCS control interface (internal machine communication system) is designed as a control connection between machine(s) and and external controllers on Cheapernet basis (IEEE 802.3 standard).

iMCS: 10Base-T / RJ45 connectors with internal Hub
Standard IEEE 802.3
For Graphical Control Panel, Film Color Correctors and Diagnostic PC with cheapernet I. F. board.

WF-monitoring

A monitoring selector allows to display a signal at several test points within the digital processing chain, for enhanced monitoring session and for test purposes.

Creativity package

The "Creativity Package" operating in the standard SDC 2002 is designed to extend various ranges of the primary color correction and to facilitate rhombic effects.

Note!
For using the rhombic effects,the option FH 1674 Rotation is required.

PTR rollers

The Particle Transfer Rollers used to clean the film during play on both sides of dirt, dust and lint.
The rollers are performed as reverse helix particle transfer rollers. That means they contain a *Micro Mat* helix side-wipe system for a powerful film cleaning.

1.2.1 GCP 1 GRAPHICAL CONTROL PANEL

The control panel GCP1 designed as graphical user interface allows all operational functions to be controlled.

1.2.2 LENS GATE ASSEMBLY AND GATE BLOCK OPTIONS

- **FSB FA 35 LGA Lens Gate Assembly, 35 mm**
  For scanning full aperture 35mm projection of aperture POS, NEG and IP films.
  Comprising:
  - Integration cylinder, full aperture film gate
  - Condenser optics, image optics
  - Test film: Chess Board

- **FSB 35 GB Film Gate, 35 mm**
  For scanning the Academy 35mm projection aperture of POS, NEG and IP films. In exchange with the 35mm full aperture film gate which is part of the FA 35 LGA.
  Comprising:
  - Integration cylinder, film gate

- **FSB S16 LGA Lens Gate Assembly, S16 mm**
  For scanning the Super 16mm camera aperture of POS., NEG. and IP films.
  Comprising:
  - Integration cylinder, film gate
  - Condenser optics, image optics
  - Test film: Chess Board

- **FSB 16 GB Film Gate, 16 mm**
  For scanning the 16mm projection aperture of POS., NEG. and IP films. In exchange with the S 16m film gate, which is part of the S 16 LGA.
  Comprising:
  - Integration cylinder, film gate

- **FH 6602 S8mm Film scanning**
  For scanning of Super 8mm film material in combination with the S16 Lens Gate Assembly.

1.2.3 AUDIO OPTIONS

Audio formats

All usual audio tracks can be scanned
16 and 35mm comopt sound (COMOPT/mono)
16mm commag sound (COMMAG/mono)
35mm comopt sound (COMOPT/Dolby stereo, switchable to mono)

Analog audio interface

The analog audio interface of the film scanner enables connection of mono or stereo signals to conventional audio studios.

Analog outputs:
- Audio 1 / 2
- Monitor L / R
- Headphone

Digital audio interface

The digital audio interface conforms to the AES/EBU standard.
The sound can be digitally delayed from the control panel.

Digital Output
- AES / EBU

- **FH 1129 Audio Scanner & Processor**
  incl.
  Audio Scanner 1 (Commag 16 mm / Mono)
  Audio Scanner 2 (Comopt 35 / 16)
  Audio Equalizer & Processor Boards
  Mounting into Rack 1 and Filmdeck

- **FY 1102 Audio Output Transformer**
  For symmetrical and ground-free **analog** outputs; galvanically isolated.

1.2.4 TE 2101 Transfer Engine Package 101 Option

TE 2101 contains a HIPPI Serial Interface and the Transfer Engine Software for high-speed film data to be fed to a computer workstation.
The accompanying Data Output I.F. Board FY 6345 is mounted in Rack 3.

1.2.5 TE 2111 GSN Transfer Engine Option

TE 2111 contains a GSN (Gigabyte System Network) Interface and the Transfer Engine Software for high-speed film data to be fed to a computer workstation.
The dedicated Data Output I.F. Board FY 6385 is mounted in Rack 3.

1.2.6 FH 1674 ROTATION OPTION / FH 1684 Rotation Upgrade Kit

Allows to rotate the picture in a range of 0 - 360° (full rotation)
incl.:
- FY 6301 Spatial Control & Address Generator
- FY 6302 Effect Spatial Processing 3x

Mounting in Rack 3

1.2.7 FH 1675 HDTV OUTPUT OPTION

Selectable are:
HDTV standards

1250/50 / 2:1	according to CCIR TG 11 or EU 95
1125/60 and 1125/59.94 / 2:1	according to SMPTE 260M
1920x1080/60 and 59.94 / 2:1	according to SMPTE 274M

FY 6313.xx HDTV Output Digital provides following digital output signals:
HDTV 4:2:2, 4:2:2:4 or 4x4 Parallel LinkA/B
or
digital serial via included serializers (2x LinkA and 2x LinkB / four BNC)

Note:
HDTV standard 1250/50 2:1 interlace not in digital serial available!

Note! **Pinning according to CCIR TG 11**

FY 6314.xx HDTV Output Analog provides the following analog output signals:
HDTV Analog RGB or Y C_R C_B standard HDTV interface

1.2.8 FH 1635 OPTION DTV

The Option DTV, operating in the Spirit DataCine film scanner SDC 2001, is designed to generate film images according to the digital TV standards listed below.

TV Standards The new selectable TV standards are:

- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive

- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive
- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1

Note!
Precondition for the operation of FH 1636 Upgrade Kit DTV is the Option HDTV Output FH 1675, installed into SDC 2002.

1.2.9 FH 6700A STEADISCAN OPTION

The option Steadiscan FH 6700A, an electronic stabilization system integrated in the Spirit DataCine Film Scanner SDC 2002, is an add-on steadiness improvement system for following applications:

- Stabilization of 35mm 4perf original camera negative film stock
- Film image stabilization for super critical film effects and compositing tasks

1.2.10 6SC SDC - 6 SECTOR COLOR PROCESSOR OPTION

Basic 6 sector color corrector for yellow, green, cyan, blue and magenta. It extends the primary color corrector already supplied with Thomson film scanners and works always in the highest possible resolution of the scanning system.

1.2.11 FH 1639 VISTAVISION OPTION

Extends the 35mm scanning formats by
- 35mm 8 perf (Vistavision) film format
- 35mm 6 perf (Cinerama) film format

Note! Option Rotation is required.

1.2.12 SGR 2000 SCREAM GRAIN REDUCER OPTION

Resolution independent Grain Reducer contains a signal processing in RGB up to 2k in real time, use of the internal real time bus interface of Spirit DataCine and controlled by the GCP or a TK controller

1.2.13 FH 6602 S8MM FILM SCANNING OPTION

See LGA and Gate options 1.2.2

1.2.14 Accessories

- **FH 1020 Basic Accessories**
  Contents:
  Toolbag with various standard and special tools
  Dustaway compressed air cleaner

- **Customer's Manual**
  Customer's Manual FU 0120

(1x already supplied with the basic unit)
incl.:
Part 1: Operation Manual
Part 2: Planning & Installation

- **FH 1660 Diagnostic Kit SDCMAINT**
  Provides comprehensive diagnostic, service presets and remote access control of the DataCine SDC 2002 via modem and software PC DUO.
  Comprising:
  - PC Software SDCMAINT DS 0153
  - PC DUO software FH 1661 for remote access control
  - PC LAN connection cable 10 m

  Features:

  - SDC 2002 Option control (views and enables additional software options)
  - iMCS protocol recording and editing
  - System messages recording, editing and weighting selection
  - Software and board version indication
  - Operating time for the DataCine, projection, capstan and audio lamps
  - Continuous realtime board check for correct type, version, sync pulses, RSCI control over temperature
  - Store, analyze and reload system dumps
  - Mini control panel
  - Interactive system tests via script files
  - Remote control access for Thomson service
  - Download of Lookuptables

  Hardware Requirements for SDCMAINT:

  - Desktop PC with a CPU Intel Pentium or compatible using Windows 95/98, Me, NT/2000 or XP
  - CD ROM drive
  - VGA graphics adapter with a minimum of 640x480 pixels and 16 colors (recommended are 800x600 or 1024x768 pixels and 256 colors)
  - 8 MB RAM
  - Ethernet card (ISA, PCI, PCMCIA or Pocket Adapter) with a BNC connector (10base2) or 10Base-T RJ45 connector.
  - Modem for remote control access with PC-DUO

1.2.15 OPTIONAL ACCESSORIES

- **FH 1921 Spare Lamp House incl. Xenon Lamp 0 128 192 110**
  Pre-mounted Xenon lamp in a house, for instant availability of the film scanner

after a lamp failure.
Xenon Lamp incl. housing

- **Air exhaust hood 2 128 500 010**
  Exhaust hood with flanges for two 10-inch air hoses.

- **Test films**

  35 mm:

Checkerboard test 35 mm (3 m)	1 131 900 332
Grating test 35mm (3 m)	1 131 900 333
Format film 35 mm anamorphic (3 m)	2 015 630 056
Format film 35 mm academy (3 m)	2 015 630 054
5MHz focus distribution 35mm	2 131 900 163
Dolby stereo COMOPT audio, with pink noise 35mm	1 011 010 082
Dolby stereo COMOPT audio, signal level 35mm	1 011 010 083
2 perf test film	1 015 630 072
3 perf test film	1 015 630 071

  16 mm:

Checkerboard test 16 mm (2.8 m)	1 131 900 336
Grating test 16 mm (2.8 m)	1 131 900 337
Format film 16 mm (3 m)	2 015 630 051
Format film 16 mm anamorphic (3 m)	2 015 630 053

- **Service Manual FU 0093 - 0 126 629 300**
  Comprehensive technical manual

1.2.16 CONSUMABLES

- **Xenon Lamp - 0 128 690 710**
  Spare xenon lamp 300 W / 24 V

- **Spare PTR set - 3 149 900 882**
  contains 4 rollers

1.2.17 FH 1032 ONE-PHASE POWER TERMINAL UNIT

(Option FH 1052 - 0 128 105 200)
Alternative to the standard Three-Phase Power Terminal.
Only for 230 V!

1.2.18 FH 1033 TWO-PHASE POWER TERMINAL UNIT

(Option FH 1053 - 0 128 105 300)
Alternative to the standard Three-Phase Power Terminal.

Note!
The phase-to-phase voltage must have a value of about 208V.
Connection: L1 + L2 + PE

Details see chapter 4.11 "Mains Voltage Connection" in this manual.

1.3 OVERVIEW

1.3.1 Operational Unit Spirit DataCine Film Scanner

The film scanner consists of the following modules:

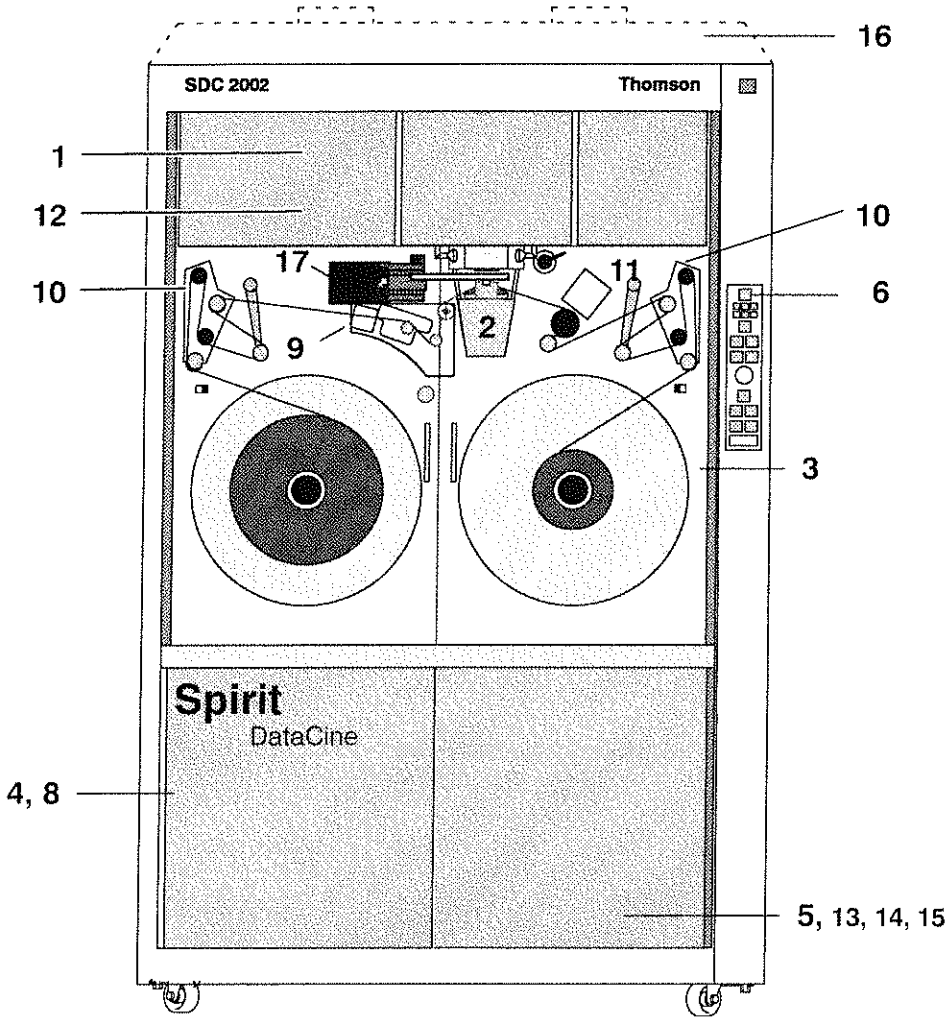


Fig. 101:

1. AIH - Analog Image Head - Processing and optional Audio Processing (Rack 1)

2. Film Scanner - Lens Gate Assembly (35mm or 16mm LGA, S8mm Scanning Option)

3. Filmdeck

4. Film Preprocessor (Rack 2)

5. Film Postprocessor (Rack 3)
   including:

SDTV Analog Out	R G B S K	or Y C_R C_B S K	
SDTV Digital Out	4:2:2	or 4:2:2:4	or 4x4

6. Local Control Panel

7. Control Panel Kit
   19-inch Rack version, see figure 102

8. Monitor Selector FY 1408.xx

9. Keycode Reader Mounting Support
   holder for AATON, EVERTZ and ARRI keycode systems

10. Particle Transfer Roller Set

11. Diagnostics Kit FH 1660 (see figure 102)
    Diagnosis & maintenance tool "SDCMAINT" incl. remote access control via PC DUO.
    Not included but required: PC with Ethernet I.F and modem.
    Hardware requirements for PC and Ethernet card see separate manual SDCMAINT.

1.3.2 OPTIONS

The following units are optionally available:

12. Audio Pick-up & Processor Set FH 1129
    On the Filmdeck:

Audio Scanner 1 FH 1013	(Commag 16) and
Audio Scanner 2 FH 1023	(Comopt 35 / 16 mm)

    Option for Audio Set 1129:
    Audio Output Transformer FY 1102

13. HDTV Processing FH 1675
    including:

FY 6314.xx HDTV Output Analog	G B R S K or Y C_B C_R S K
FY 6313.xx HDTV Output Digital	4:2:2 or 4:2:2:4 or 4x4
2x HD Serializers HD 10SR	4:4:4 or 2 x 4:2:2

14. TE 2101 Transfer Engine Package 101
    incl.
    FY 6345.xx Data Output I. F. Board,
    FH 6335 HiPPI Serial I.F. for data transmission via fibre optic cable
    and Transfer Engine software for high-speed film data to be fed to a computer workstation.
    alternatively
    TE 2111 GSN (Gigabyte System Network) TransferEngine

15. Rotation FH 1674
16. Air Exhaust Hood 2 128 500 010
17. FH 6700A Steadiscan
18. S8mm Film Scanning, see item 2.

Separate units

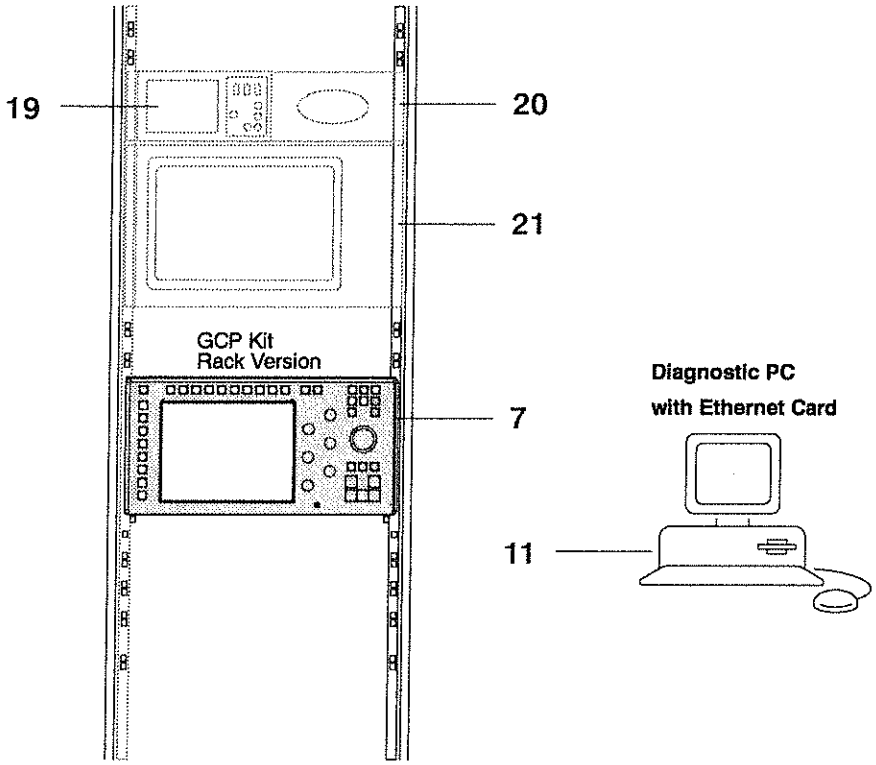


Fig. 102:

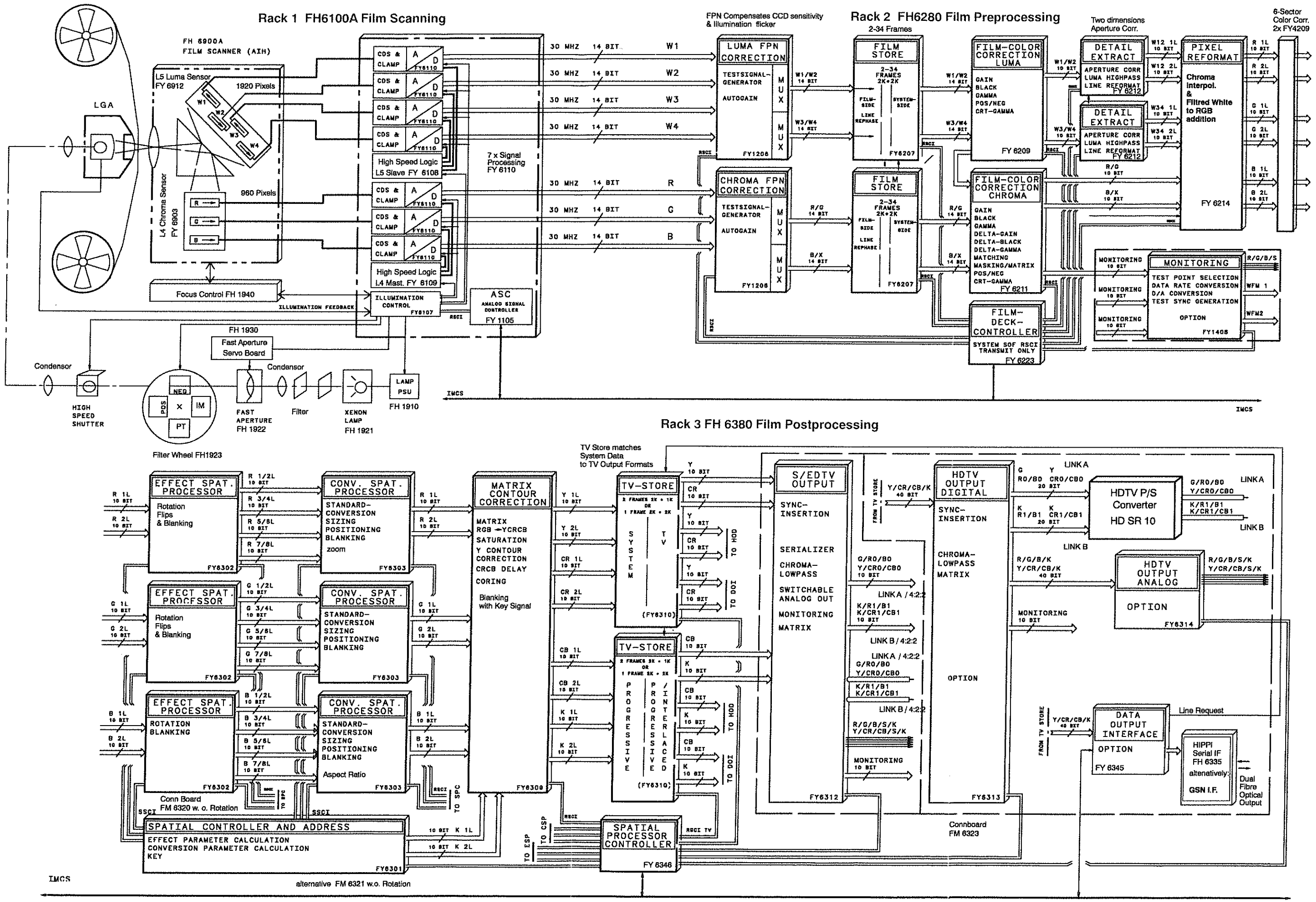
For SDC 2002 system configuration, the following units are recommendable:

19. Waveform monitor - multistandard (e.g. Philips PT 5464 HD)

20. Active audio speaker (e.g. Fostex 6301B)

21. Video color monitor (e.g. Sony 2010 / SDTV or Barco HDM 2051/HDTV)

1.3.3. Blockdiagram Spirit Datacine Film Scanner - Video Signal Path -



1.3.4 THEORY OF OPERATION

The film scanner signal processing is performed in three 19-inch Racks 1 - 3.

The system is designed to be operated remotely from a separate control system via cheapernet interface RJ45 / **iMCS**.

A local control panel serves for basic operation at the DataCine.

Philips provides a full feature Functional Control Panel CP1 as a remote device.

The main units are:

- FD & LGA **Film Deck with LGA & Local Control Panel**
- Rack 1 **Film Scanning and option Audio Processing**
- Rack 2 **Film Pre-processing**
- Rack 3 **Film Post-processing**
- GCP1 **Graphical Control Panel (full feature remote device)**

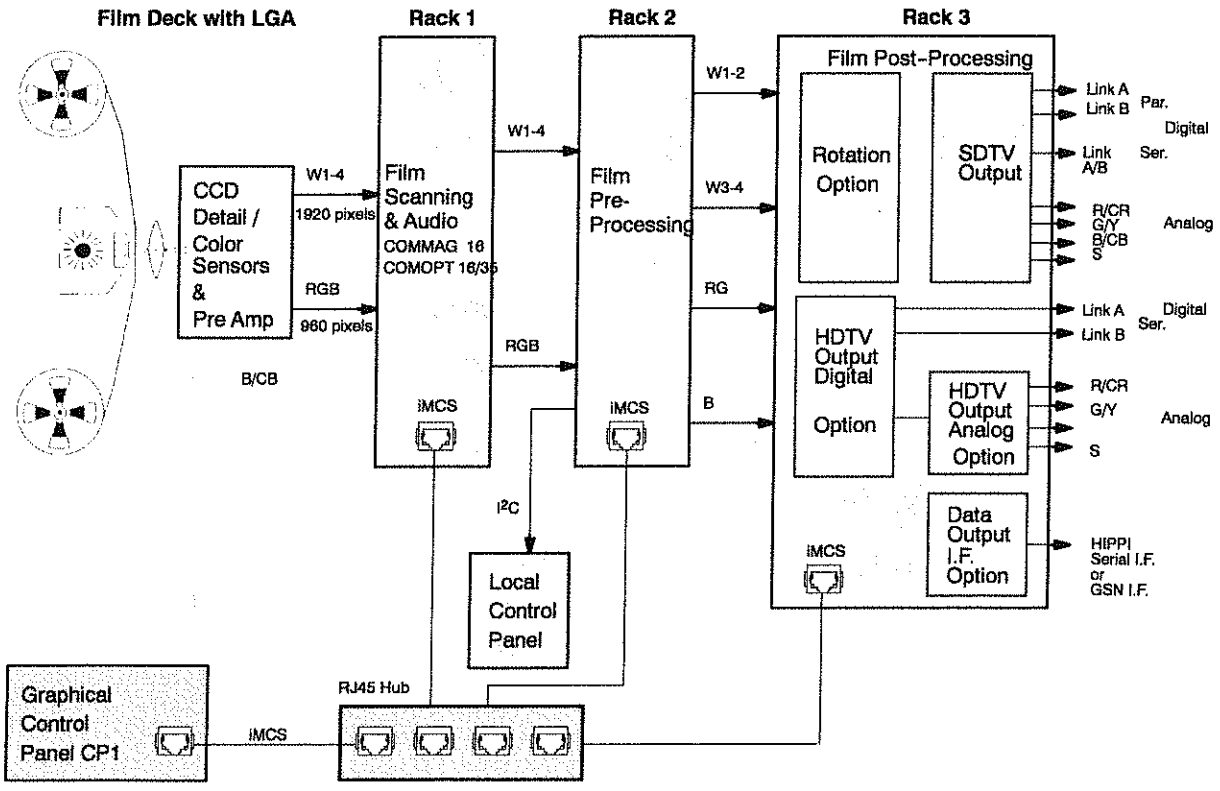


Fig. 103: Film scanner signal processing

Overview

Rack 1 named "Film Scanning and Audio Processing" receives seven analog channels (White 1-4 and R G B) from the CCD preamplifier.

This Rack contains the A/D converters supplying seven data streams of 14 bit words to the second Rack "Film Pre-processing".

Dual channel audio processing and digital delay to compensate for different sound to picture distance is another task for Rack 1 (Audio FH 1129 option).

The video data passes through Rack 2 "Film Pre-processing" and Rack 3 "Film Post-processing" which provides SDTV and optionally HDTV or film data dpx signals.

Output Signals

The following output signals are available:

Rack 3

SDTV mode

- Parallel Digital Out — 4:2:2 or 4:2:2:4 / Y C_R C_B K
  or
  4x4 / G B R K or Y C_R C_B K
- 2x Serial Digital Out — same as parallel digital out
- Analog Out — R G B S K or Y C_B C_R S K

HDTV mode (optional with FY 6313 / FY 6314)

- Parallel Digital Out 4:2:2 or 4:2:2:4 / Y C_R C_B K
  or
  4x4 / G B R K or Y C_R C_B K
- Serial Out 4x4 / G B R K or Y C_R C_B K (2x2 BNC)
- Analog Out — G B R S K
  or
  Y / C_R / C_B / S / K

Data mode

- Option TE 2101 Transfer Engine:
  HIPPI Serial I.F. FH 6335
  High-speed data transmission to a computer workstation via fibre optic cable.
- Option GSN Transfer Engine
  Gigabyte System Network
  High-speed data transmission to a computer workstation via GSN Interfacing and GSN Switch.

Control System

Each rack is controlled by its dedicated microcomputer. A fast communication bus using "Cheapernet based internal Machine Communication System (iMCS)" connects the microcomputer controller boards with the Graphical Control Panel, also providing RS 422 control interface and RS 232 diagnostics interface.

Basic operation facilities are provided by the standard Local Control Panel via I^2C bus.

1.3.4.1 Rack 1 Film Scanning & Audio Processing

The film scanning unit and audio processing (optional) contain the following devices.

- AIH Film Scanning Systems
- Signal Processing (A/D Converter)
- Audio Processing (Option)
- ASC Analog Signal Controller

AIH Film Scanning System

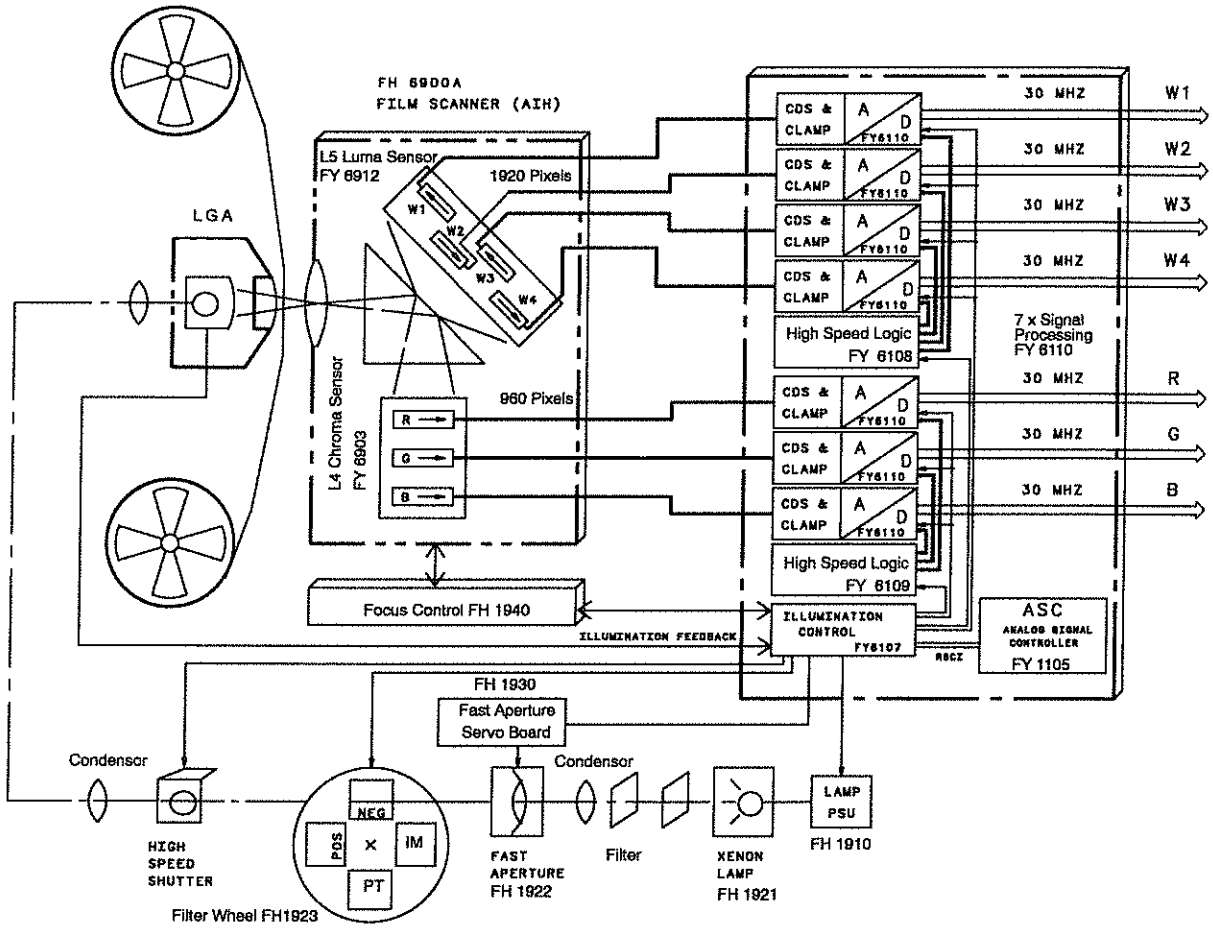


Fig. 104:

AIH
FH 6900

The AIH (Advanced Imaging Head) is a high-performance CCD scanner system and consists of:

- **optical path** with
  Xenon lamp, condenser lens 1, hot mirror (infrared filter), heat absorbing filter, fast aperture, 4-position filterwheel with safety shutter, condenser lens 2, integration cylinder and projection lens
- beam splitter
- triple line RGB CCD sensor
- quad 1/4 line Detail (Luminance) CCD sensor

CCD film scanner optical path

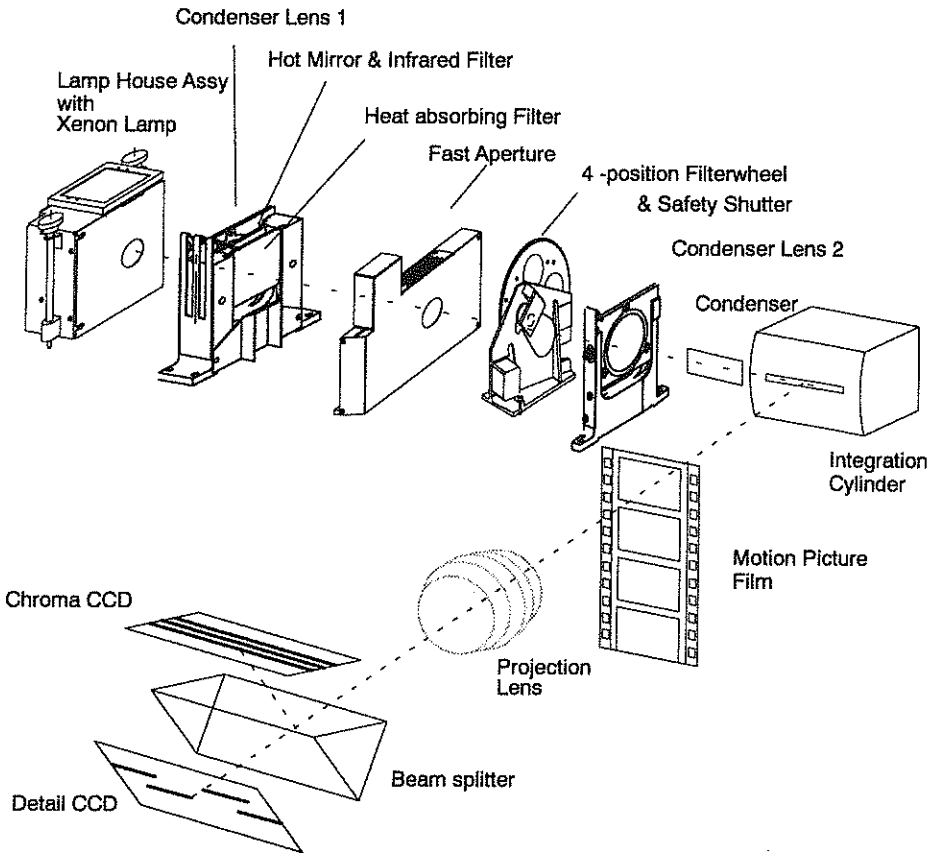


Fig. 105:

Xenon Lamp 300W FH 6907

Illumination is the key element; it must be spectrally broad-band, possess flexible intensity and has to provide a uniform energy across the visible spectrum. A Xenon lamp illumination source is capable of providing these requirements.
The lamp is supplied by a Lamp Power Supply Unit (10 - 24 A) which is controlled by the board ASC (Analog Signal Controller).

Note! Observe technical information TM 638 "Illumination Level and Xenon Lamp Specifications" in the supplements of this manual.

Condenser Lens 1

Condenser Lens 1 bundles the light at the input of the optical path.

Hot Mirror

A dichroic mirror reflects a large amount of the heat in the light beam. This dichroic mirror is positioned at an angle to the light beam so that the heat is not bounced back directly at the lamp.

Heat absorbing Infrared Filter

A filter system protects the sensitive CCD sensors against the infrared component of the light source.

Fast Aperture FH 1922

The Xenon light then passes through an adjustable aperture.
In the film scanner, a high-speed electromechanical aperture is used to control video gain levels by changing the illumination level for scenes with different minimum film densities.

Filter Wheel FH 1923

For optically matching the various film material, the light passes through the filter wheel.
It consists of a motor driven wheel with the following filters:

- **PRINT** for positive or negative film material
- **COLOR** for positive or negative film material, with orange mask for better color separation
- **PT** for Prime Time positive or negative material, with an orange mask
- **IIMED** for intermediate (positive or negative) film material also with an orange mask

Dichroic filters are used in the design of each of these 4 filters for transmission and wavelength selectivity.

The dichroic filters match the illumination characteristic to the respective film dye characteristic.

Safety Shutter

Caps the Xenon illumination after the film has stopped or during film gate change.

Condenser Lens 2

A second condenser lens bundles the light into the integration cylinder.

Lens Gate Assemblies

For the film scanner there are 35mm and 16mm lens gate assemblies available:

- **FSB FA35 LGA**
  35mm Full Aperture Lens Gate Assembly
- **FSB S16 LGA**
  Super 16mm Lens Gate Assembly

The lens gate assemblies are designed for rapid change-over and facilitates the usage of optical effect filters.

Integration Cylinder

The illumination reaches the film at the film gate by passing an illumination integration chamber.

The cylindrical integration chamber is coated with a highly reflective paint material.

The illumination light rays bounce around inside the chamber to form a diffuse "spray" of rays as they exit the illumination slot. This slot is in a plane in parallel to the film path.

The diffuse illumination softens the projected edge of scratches, masking approximately 80 % of the scratches as far as the image color dyes are not damaged.

This process dramatically reduces the need for wet gate transfer.

Film Gate Block

The film is transported over a skidplate and guided by a ceramic plate and spring rollers. This provides a gentle and stable movement of the film through the imaging area.

Projection Lens (Optics)

The 35mm / 16mm projection optics consist of high-performance lenses, optimized for the appropriate film format and designed to provide high chromatic fidelity.

Beam Splitter

A beamsplitter separates the image information into two separate paths one towards the smaller luminance detail array photosites and the other towards the larger color array photosites.
This unique imaging architecture is a key factor in the film scanner achieving an excellent "signal-to-noise" performance and high resolution.

Scanner Sensors FY 6912 Lum FY 6903 Chrom

4 x 1/4 Line CCD for Detail Signal (White 1-4)

The horizontal scan resolution of 1920 pixels is created by a unique silicon CCD design.

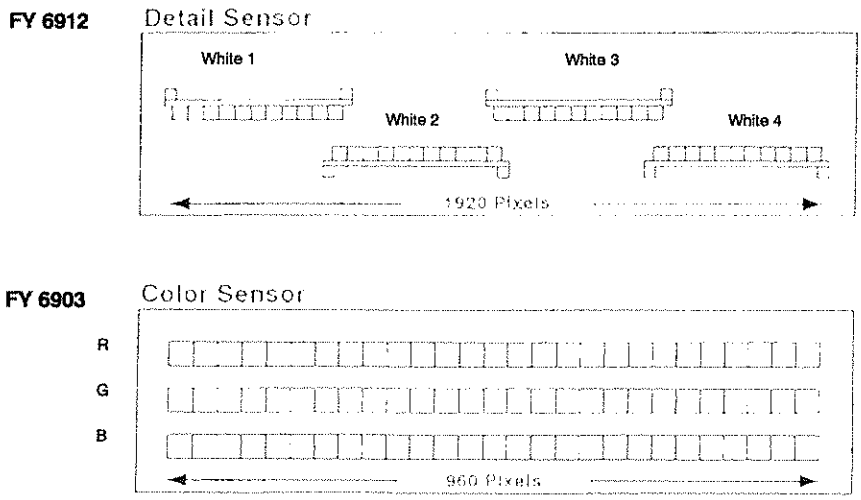


Fig. 106: CCD line sensors

In order to achieve the most efficient transfer of image information content, the detail sensor pixels were divided into four linear arrays.
This allows the CCD line readout to be done in four parallel channels of more than 480 pixels each.

By this principle, the pixel sampling rate of approx. 120 MHz for a high-resolution line can be reduced to 30 Megasamples per second for each detail channel.
The four detail channel linear arrays are located on one sensor chip.

3 x CCD Line Array Chroma R G B:

A color sensor contains three linear arrays, one for Red, one for Green and one for Blue in order to capture the scene color information from the film.
Each of the three arrays contains more than 960 pixels and has photosites that are 4x the size of the detail sensor photosites.

Dichroic filters

Red, green and blue dichroic filters are placed over each CCD line array in order to filter the broad spectral bandwidth of the image projected onto the sensor photosites.

Film Scanner Signal Processing FY 6110

After separating the image information into the luminance and chrominance paths, the film-modulated illumination has now been converted into seven channels of CCD sampled analog signals, with each channel operating at 30 MHz.

This is equivalent to 210 MHz Megasamples per second, 120 of detail and 90 of color. Each sample is electronically captured and compared to analog ground. The analog voltage difference is A/D converted into a 14-bit code word.

The seven signals - W1 - 4 and R G B - are then routed to Rack 2.

High-Speed Logic L4 Master FY 6109 L 5 SLave FY 6108

Two of High Speed Logic Boards with common artwork are used in the AIH film scanner to realize time synchronization between CCD scanner head and the film clock generator. These boards create the clocks for the signal processing and the master clock for the rest of the SDC 2002.

ASC FY 1105

Analog Signal Controller ASC

The dedicated rack controller ASC is connected to all boards via RSCI (Rack Serial Control I.F). It provides all modules of the cabinet with control and setup parameters and communicates with the other rack controllers (FDC Rack 2, SPC Rack 3) and external controllers via ethernet interface.

The following main functions are provided by this unit:

- Setup and control of all audio functions

- Control of the analog image head (AIH) including:
  Focus adjust
  Gate and optics
  Lamp and fast aperture
  Illumination
  AIH diagnostic

Audio Processing FH 1129 (option)

Block diagram see figure 107

COMMAG COMOPT

The optional Audio Set FH 1129 provides the following audio systems:

- 16mm Magnetic Sound **(COMMAG 16 Mono)**
- 16mm Optical Sound **(COMOPT 16 Mono)**
- 35mm Optical Sound **(COMOPT 35 Left / Right)**

Audio Scanner 1&2

All the above audio magnetic and optical scanning systems are part of Audio Scanner 1 & 2 assembly.

FH 1013	Audio Scanner 1	COMMAG 16 mm mono
FH 1023	Audio Scanner 2	COMOPT 16mm mono/35mm stereo

Audio Scanner 1 & 2 is a single unit mounted close to the capstan drive.

Equalizer Board FY 1101

The pre-amplifying and electronical equalization of the signal is done on the Audio Equalizer Board FY 1101.

Alternatively an external SEPMAG stereo signal can be connected on XLR socket EXTERN 1 / 2 IN.

If a "Dolby processed" film is replayed, an external Dolby A / SR noise processing system can be used.

Audio Processor FY 1103

Due to the positions of the scanners for image and sound information from the film, audio is advanced with respect to the video output signal.

This is compensated by a digital audio delay on the Audio Processor FY 1103.

The balanced output signals (Audio 1 / 2; Monitor left / right) are floating and can be switched to various studio levels -3, 0, 4, 8 dB.

An additional digital audio output is provided according to the AES / EBU standard.

The digital audio signal is synchronized either to an external 48 kHz signal or to the internal video signal.

A 48 kHz output is provided to synchronize external audio equipment.

Audio Processor FY 1104 EBU Level

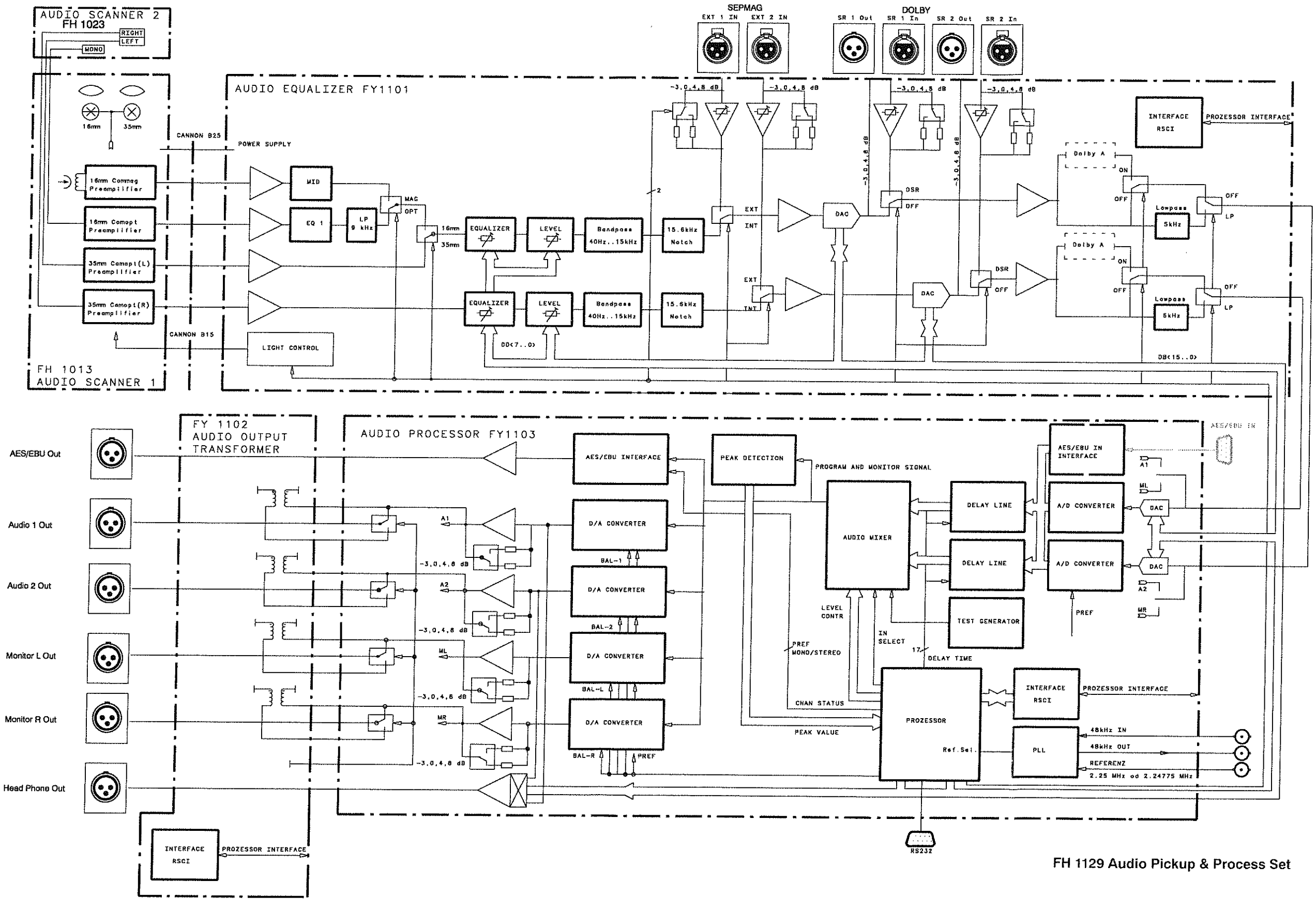
Note!
Normally the digital audio level adjustment is done according to SMPTE Recommended Practice "Audio Levels for Digital Audio" RP 155-1997.
For European customers, the digital audio level setting according to EBU R68-1995 can be implemented with the optional Audio Processor Board FY 1104 instead of FY 1103.

Output Transformer FY 1102

(Additional option)
The Audio Output Transformer FY 1102 should be used if a symmetrical ground-free analog signal is required.

If only AES / EBU digital audio is used, the output transformer option is of no use.

1.3.4.2. Audio Blockdiagram



FH 1129 Audio Pickup & Process Set

Fig. 107:

1.3.4.3 Rack 2 Film Preprocessing

The film preprocessing consists of the following functional units:

- Fixed Pattern Noise Correction
  with Auto Gain and Test Generator
- Film Store
  with Line Rephasing and System Clock Generation
- Film Color Correction
  with Gain-, Black-, White-, Pos / Neg-, CRT-Gamma- and Matching Correction
- Option 6-Sector Color Correction
- Film Clock Distribution
- Detail Extractor with Contour Correction
- Pixel Reformator with Chroma Interpolation
- Film Deck Controller
- Monitoring

Rack 2 FH 6280 Film Preprocessing

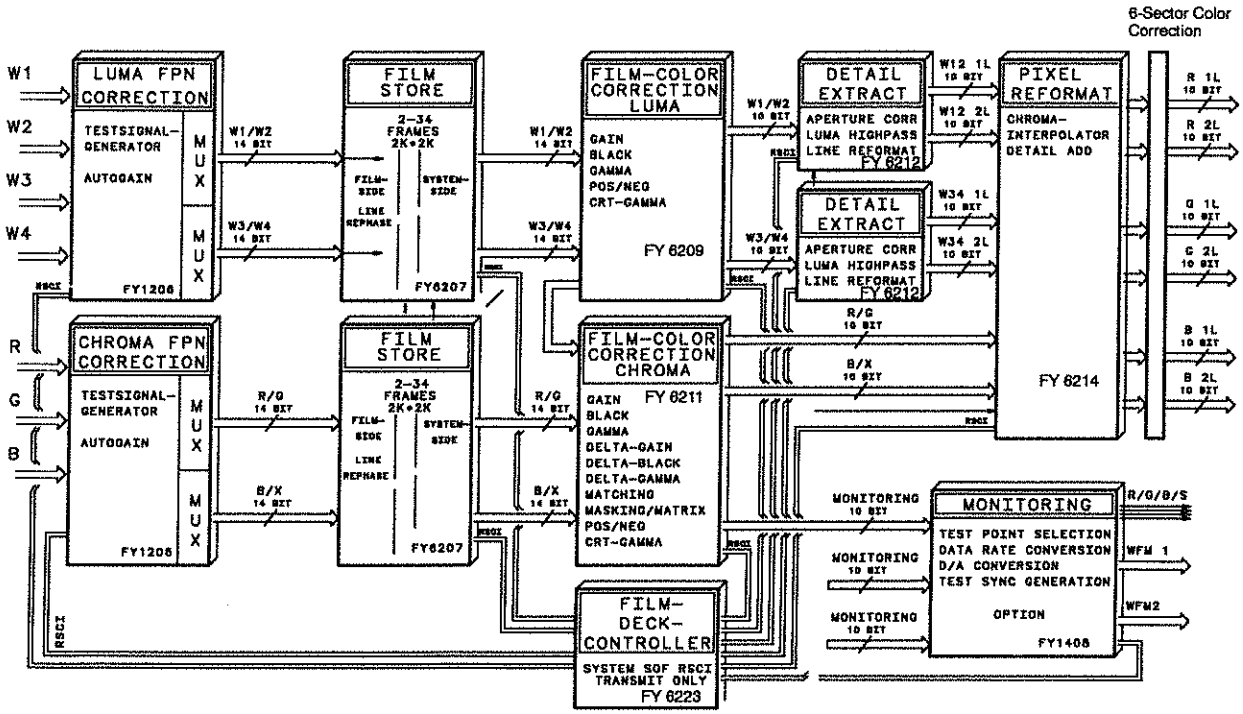


Fig. 108:

Fixed Pattern Noise (FPN) Correction

FPN Luma
FPN Chroma
FY 1206

The FPN correction boards receive their input signals from the Rack 1 A/D convertors.

Different CCD sensitivity and not 100% constant illumination at all CCD elements require a compensation of spikes, humps or dips - called fixed pattern noise - in the video data signal.

The FPN correction signal is produced by evaluation of CCD output data (RGB - W 1 - 4) at a constant light level with open film gate.
The light is adjusted until the most sensitive CCD pixel element delivers a 100% value.

Building the reciprocal value of the evaluated samples and multiplying these values with the corresponding signal of CCD output will result in elimination of fixed pattern noise.

An integrated test signal generator is used for some additional features such as sending test signals or switching off various channels.

Before further processing, the seven data signals (W 1-4 and RGB) are multiplexed to two detail (W1/2 and W3/4) and two color (R/G and B/-) data signals and routed to the film store boards.

The block diagram of figure 108 shows the four detail (W 1 - 4) and three color (RGB) inputs, 14-bit sampled, on the left and the four outputs as 10-bit data streams on the right hand side.

Film Store

FIS
FY 6207

The film store configuration consists of two identical boards FY 6207 luminance and FY 6207 chrominance.

Seven data signals (W 1-4, R G B / 14 bit / 30 MHz) are stored. This is done on the two identical frame store boards, each handling two multiplex channels: [W1/2]; [W3/4]; [R/G]; [B/-].

A correction of the spatial offset between the detail sensor line arrays and the color sensor line arrays is performed in this film store section (line rephasing in a memory block).
Because input data is not provided simultaneously, all channels are written asynchronously with the CCD line scan pulses into a large input FIFO and after a delay the FIFO outputs are read synchronously at a higher rate.

Compressing the data through these FIFO enables that writing to and reading from the RAM section of the Film Store is possible within one input line.

Clock Levels

The advantage of this method is to handle the data in three synchronous sub-systems:

- Input or Film Clock level (AIH Clock)
- RAM Clock Level (Local Clock Distribution)
- Output or System Clock Level (external Local Clock Distribution))

The output side of the frame store boards is also a synchronous design with master clock from an external Local Clock Generation.

Store Capacity

The store capacity is by default 2 frames:
Each Luma frame takes 4 x 488 pixels x 2 k lines in detail line resolution.
DRAM module connectors on board allow an upgrade to up to 34 frames.

Film Color Correction

FCC
FY 6209 / 6211

The Film Color Correction is divided into two boards.
The white channels are processed on board FY 6209, the color channel processing is located on board FY 6211.

Two film matching functions are available:

- R G B Gain for the basic setup of the amplification in R,G or B (not linked to black).
- R G B Black for the basic setup of the black levels in R, G or B (film density related)

Matching is applied after the signal inversion in case of negative film and is also available for positive film.

The functions

- Master Gamma
- Master Black
- Master White

of the Primary Color Correction control the image level and gradation of the film in general, whereas

- Delta Gamma
- Delta Black (Lift)
- Delta White (Gain)

offer separate adjustments in R G B.

Masking

A masking function serves for compensating of the influence of spurious color densities (crosstalk) within the film dye layers.

Specific coefficients for different film types can be selected from the Functional Control Panel.

Depending on the filmstock, masking is applied to a logarithmic (e.g. for OCN material) or a linear (e.g. for PRINT material) signal.

A CRT - gamma compensation is selectable ON or OFF separate from the Master Gamma.

After signal corrections, the four channels W1/2, W3/4, R/G and B/- are routed to the Detail Extractor.

The "Film preprocessing" Rack 2 combines high-pass filtered white signals (W 1/2 L1; W 1/2 L2; W 3/4 L1; W 3/4 L 2) with the interpolated R G B signals in an initial filter arrangement, consisting of the boards Detail Extract and Pixel Reformatting.

This method creates a high-resolution 1920 pixel R G B signal.

Detail Extract

DEX
FY 6212

At first the Detail Extract generates high-pass filtered white signals for the high-resolution R G B output.

The board includes also signal enhancements (Aperture Corrector) with user-adjustable frequency peaking for horizontal and vertical detail.

The aperture corrector is two-dimensional and can be adapted for anamorphic scanning.

Pixel Reformatting

PRF
FY 6214

The Pixel Reformatting stage interpolates the R G B signals and adds the high-pass filtered white to each RGB channel.

So the four segments of the detail sensors are re-arranged and the missing R G B interlace lines are regenerated.

6-Sectors Color Correction

6 SCC
FY 4209

The 6SC consists of two plug in boards FY 4209 and allows for color selective modifications of the image via luminance, hue, saturation processing for red, yellow, green, cyan, blue and magenta. All modifications are weighted with the saturation to avoid any change of black or white objects.
To perform a smooth transition between modified colors, each sector has a center hue where all modifications will apply 100%, and a symmetric width with a linear decrease of the modifications towards zero at the sector boundaries.
To allow a creative color makeup the center position and the sector width are adjustable individually for any of the six sectors.
6SC operates within SDC 2002 between the pixel reformatting stage and the spatial processor of Rack 3.

6SC boards are optional and can be replaced by the Bypass Board FY 4229 interconnecting input and output of the 6SC board.

Bypass 6-Sector Color Correction

Bypass 6 SCC
FY 4229

With FY 4229, the data signal will be bypassed through slots 15 and 16 of Rack 2 if the FY 4209 "6-Sector Color Correction" is not available.

Filmdeck Controller FDC

FDC
FY 6223

The dedicated Rack 2 Filmdeck Controller FDC is connected to all boards via RSCI (Rack Serial Control I.F).

It provides all modules of the cabinet with control and setup parameters and communicates with the other rack controllers (ASC Rack 1, SPC Rack 3) and external telecine controllers via a thin wire ethernet interface (iMCS).

The following main functions are provided by this unit:

- Film transport, frame counting and timecode generation in combination with the servo board Capstan Ctrl. & Sprocketwheel Generator.
- Controlling the film store
- Controlling all primary color corrections
- Interface to keycode readers
- Interface to external timecode generators
- Interface to following control units:
  Local Control Panel via an I^2C Bus
  Parallel port interface REM6
  Functional Control Panel CP1 and telecine controllers via iMCS

Filmclock Distribution

FCD
FY 6241.xx

The AIH feeds the Filmclock Distribution Board FY 6241 with master clock pulses. All pixel-relevant clocks are distributed to Rack 2 and Rack 3 boards.
Dependent on the film format and the operation mode, the line rate and film rate pulses for scanning and picture processing are generated and distributed to the boards of Rack 2, the AIH and to Rack 3 for signal processing.

Monitoring Selector

MON
FY 1408

The Monitoring Board FY 1408 selects various test points. It helps the operator in terms of color grading in RGB, focus adjustment and checking the video path by providing several waveform monitoring test points e.g.:

- FPN correction (RGB)
- Color matching (RGB)
- Primary color correction
- Film scanner output (RGB or Y C_R C_B)

All signal inputs of the board are digital and all signal outputs are analog. A standard waveform monitor is used as a display.

The output synchronization is always according to the selected video standard for both, film- and video related test points.

For data operation, HDTV synchronization is used and only film-related test points are available.

Not supported is white channel monitoring, composite signal monitoring, frequency response measurement and film scanner output monitoring in data mode.

1.3.4.4 Rack 3 Film Postprocessing

The film postprocessing consists of the following functional units:

- 3 x Effect Spatial Processing **FY 6302** (option Rotation)

- Spatial Controller & Address **FY 6301** (option Rotation)

  standard alternative :
  3x Connection Board **FM 6320** (w.o. Rotation)
  1x Spatial Controller & Address **FY 6321** (w.o. Rotation)

- Conversion Spatial Processing **FY 6303**
  with TV Standard Conversion, Film Sizing and Re-positioning

- Matrix & Contour Correction **FY 6309**
  with Matrix RGB --> Y C_R C_B, Saturation Control and Key Signal Insertion

- 2x TV Store **FY 6311**
  with Progressive to Interlace Conversion

- SDTV / EDTV Output **FY 6312**
  with Digital and Analog Output Interfaces

- HDTV Output Digital **FY 6313** (option)
  with Digital Interfaces

- HDTV Output Analog **FY 6314** (option)
  with Analog Interfaces

- Genlock and Sync Generator **FY 6338**
  for Sync Pulse Generation SDTV, HDTV and DTV.

- Spatial Processor Controller **FY 6346**
  for Rack 3 Control

- Data Output Interface **FY 6345** (part of option TE 2101)
  for DPX and TIF data formats.

- HIPPI Serial Interface **FH 6335** (part of option TE 2101)
  for high-speed data transmission via optic fibre cable.

- alternatively to HiPPI I.F.:
  Data Output Interface **FY 6385**
  part of option GSN TransferEngine TE 2111

Rack 3 Film Postprocessing
Part 1

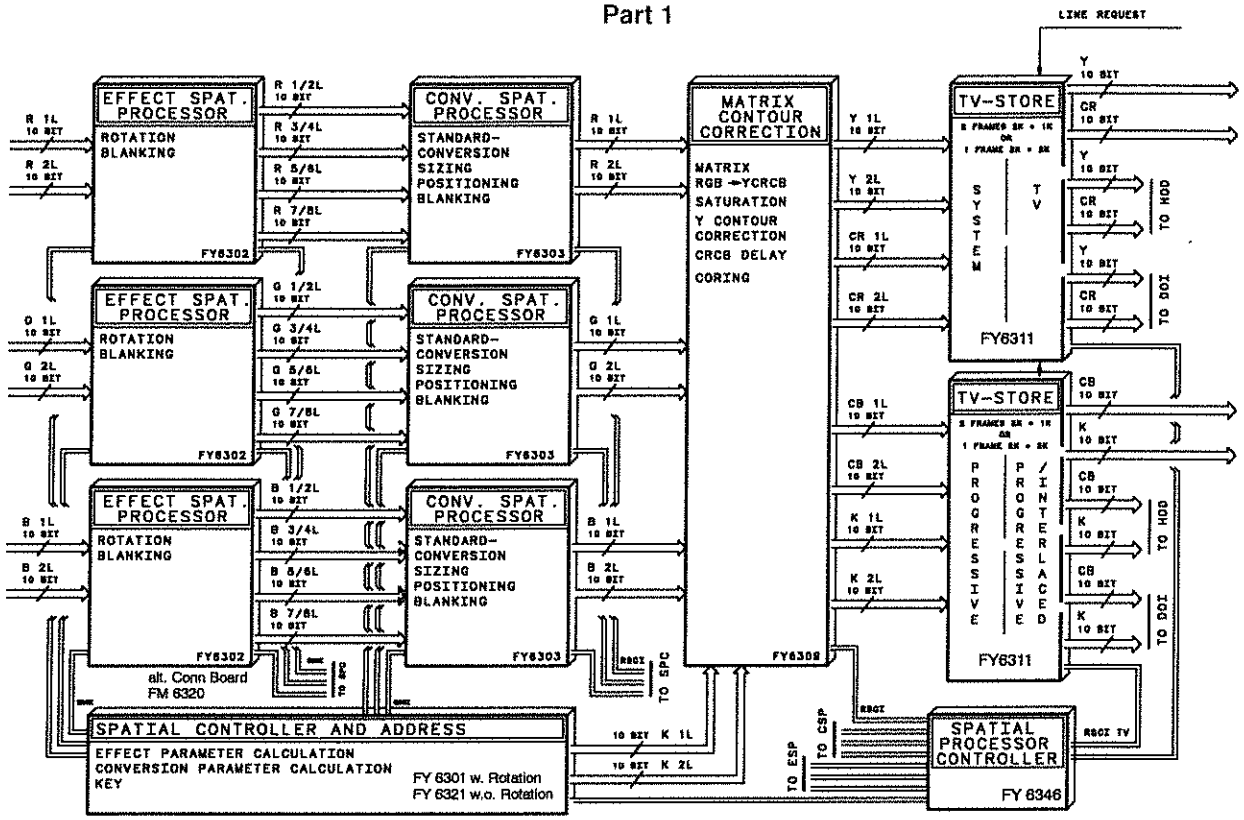


Fig. 109: Rack 3 part 1

Part 2

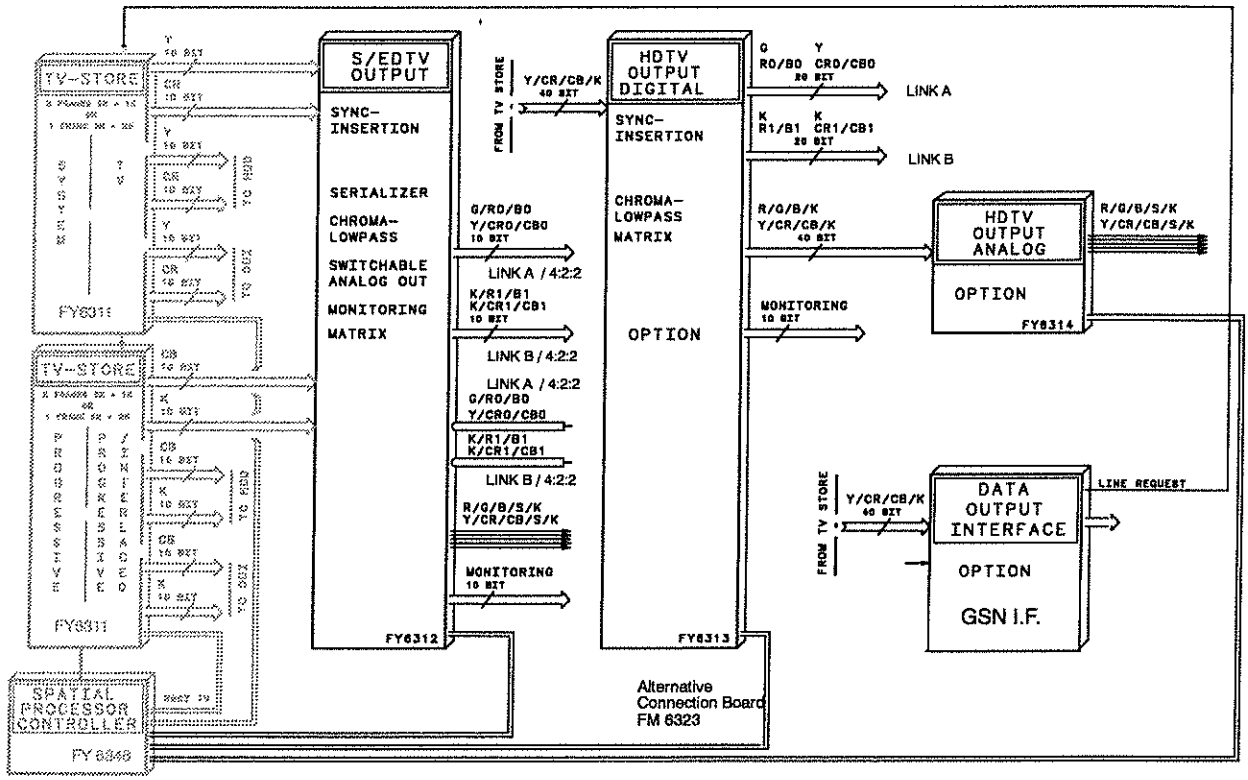


Fig. 110: Rack 3 part 2

Effect Spatial Processing (see figure 109)

ESP FY 6302

The Effect Spatial Processor (ESP) is based on a scalable multiphase FIR filter and consists of three boards FY 6302.

In a first step, the ESP implements the high-resolution rotation of an input image.

The full rotation of ± 180 degrees is implemented together with the Rack 2 boards Film Store FIS, Detail Extract DEX and the Pixel Reformat PRF.

These boards are implementing the horizontal and vertical flips.

The ESP provides the -45 to +45 degree rotation. The maximum size of the input image is limited to 1928 pixels by 1840 lines.

Each direction contains 8 pixels overhead, to be thrown away after the filtering process.

Furthermore, this unit performs the necessary film blanking.

The ESP boards are optional and can be replaced by the Connection board (FM 6320) interconnecting input and output of the ESP board.

Conversion Spatial Processing (see figure 109)

CSP FY 6303

Similar to the ESP, the Conversion Spatial Processor (CSP) is based on a scalable multiphase FIR filter and is responsible for:

- Zooming and repositioning
- Conversion to different aspect ratios
- Scrolling
- Down conversion to SDTV standards

The CSP can operate as a slave of the Pixel Reformat board when the option Effect Spatial Processing FY 6302 is not present.

Otherwise, it operates as a slave of the ESP. The CSP provides the zoom, horizontal positioning, vertical subline positioning between two input lines and blanking dependent on the ESP presence.

The vertical line positioning in two-line resolution is done by the ESP, if present. Otherwise, this task is done by the Film Store (FIS).

SCA FY 6301

Spatial Controller & Address

The Spatial Controller and Address (SCA) has two main functions.

First, it generates the control information for the Effect Spatial Processing FY 6302 and Conversion Spatial Processing FY 6303 boards.

It calculates the required filter coefficients and pulse sequence timing creating the input / output ratio for pixels and lines.

Second, the SCA generates the key signal (visible blanking signal).

Several Digital Signal Processor units implement these tasks.

The SCA receives its control information from the Spatial Processor Controller (SPC) via the RSCI bus.

Matrix & Contour Correction

MCC
FY 6309

The tasks of the MCC are:

- Blanking of video with a key signal supplied from the Spatial Controller & Address board SCA.
- Modification of video with a marker signal supplied from SCA
- RGB to Y C_R C_B conversion and color saturation adjustment
- Y contour correction with coring (noise suppression threshold)

Blanking

The R G B signal is blanked by a key channel signal provided by the Spatial Control & Address board.

The key signal represents blanking in the active image area

Level of blanking area	040_h
Level of picture area	$3AC_h$

The special bit-modified key signal generates a blanking with the required $\sin^2$ shaped edges.

The user may force the SCA to generate different key levels for external use. The MCC key processing is then turned off via RSCI.

Marker Lines

A marker bit is provided by the SCA controller board. With this bit the MSBs of the R G B signals are inverted, resulting in horizontal and vertical marker lines in the output video signal which are bordering the transferred image area in a preview mode.
This function is switchable on / off.

Matrix

The R G B to Y C_R C_B conversion is realized by using 3x3 matrix multipliers. Nine coefficients are used to calculate the **Component Y C_R C_B signals.**

The sets of coefficients are changed according to the selected TV standards.

Color saturation adjustment is performed by variation of the coefficients.

Contouring & Coring

A digital high pass filter is used to obtain the Y signal's horizontal and vertical high frequency components, which are then added to the Y signal for contouring.

A coring stage for noise suppression ensures that this operation is only executed, if the high-pass signal exceeds a certain level.

The MCC board supplies the following **TV Store FY 6310** with wide-band (10 bit) SDTV 4x4 signals as Link A (Y, C_{R0}, C_{B0}) and Link B (K, C_{R1}, C_{B1}).

TV Store

TVS FY 6311

The TV store matches the system data to suit to the different output formats.

The film scanner is equipped with two identical TV Stores FY 6311.

The system side input data is transmitted from the Matrix & Contour Correction (MCC) board FY 6309 in four channels.

Each channel is split into two 10-bit data streams (even and odd lines). The data is transmitted using ECL technology at a clock rate of 60 MHz.

Each of the TV store board handles two channels. One board handles the luminance channel Y and the color channel C_R. The other handles the second color channel C_B and the key signal K (visible blanking).

The data stream out of the matrix board is progressive. This data is fed into various FIFOs of the TV store.

The storage capacity per channel is either two frames of 2 k pixels and 1250 lines or one frame of 2 k pixels and 2.5 k lines.

The board is also equipped with an additional field store, which saves the last output field.

This field is repeated for TV formats and film speeds which require more fields than the film scanner scans from film within a certain time slot (e.g. 2/3 pulldown sequence at 24 fps for 60 Hz standards).

Depending on the selected output standard (SDTV, EDTV, HDTV or film data) the output format of the TV store is either interlaced or progressive.

After adding the sync frame, the output data supplies the S/EDTV output board FY 6312, the HDTV Output board FY 6313 or the data output interface (HIPPI) board FY 6345.

ECL technology is also used for the output data transmission at a maximum clock rate of 74.25 MHz.

Unused SDTV / EDTV or HDTV outputs are switched off.

Genlock Sync Generator

GEN FY 6338

A genlock sync generator for SDTV, HDTV and option DTV is part of Rack 3.

FY 6338 supports the following standards:

- 525
- 625
- 1125 / 60 or 59.94 Hz
- 1250 / 50 Hz
- 1920x1080 / 60 or 59.94 Hz 2:1
- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive
- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive

- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1

Spatial Processing Controller

SPC
FY 6346

The dedicated Rack 3 Spatial Processing Controller SPC is connected to all boards via RSCI (Rack Serial Control I.F).

It provides all modules of the cabinet with control and setup parameters and communicates with the other rack controllers (ASC Rack 1, FDC Rack 2) and external controllers via a thin wire ethernet interface.

The following main functions are provided by this unit:

- Setup and control of all TV standard related functions
- Controlling the TV-store
- Setup and control of all image geometrical functions like zooming, sizing, rotation, blanking ...
- Generating timecode for output interfaces (in preparation)
- Setup for Y C_R C_B to R G B conversion
- Setup of blanking and sync signals for various standards
- Setup for different video output modes

SDTV / EDTV Output Interface

SOI
FY 6312

The FY 6312 board is the digital and analog output interface of the film scanner.

625/50 or 525/59.94 2:1 interlace standards are supported.

In these standards, different data formats are selectable, see the following table:

SDTV

according to CCIR 601 / EBU TECH 3267E and 3268E / SMPTE 125 M - 1992

	Link A	Link B	Sampling Frequency	Notes
● 2* 4:2:2	Y C_R C_B	Y C_R C_B	13.5 MHz	C_R / C_B halfband filtered
● 4:2:2:4	Y C_R C_B	K O O	13.5 MHz	C_R C_B halfband filtered
● 4:4:4:4	Y C_{R0} C_{B0}	K C_{R1} C_{B1}	13.5 MHz	with 0/1 meaning even respectively odd samples
● 4:4:4:4	G B_0 R_0	K B_1 R_1	13.5 MHz	Fullband G, B, R and Key signal with 0/1 meaning even respectively odd samples

EDTV

according to SMPTE 267 M, Oct. 94 and ITU R 206/11 Oct. 94

	Link A	Link B	Sampling Frequency	Notes
● 2* 4:2:2	Y C_R C_B	Y C_R C_B	18 MHz	C_R / C_B halfband filtered
● 4:2:2:4	Y C_R C_B	K O O	18 MHz	C_R C_B halfband filtered
● 4:4:4:4	Y C_{R0} C_{B0}	K C_{R1} C_{B1}	18 MHz	with 0/1 meaning even respectively odd samples
● 4:4:4:4	G B_0 R_0	K B_1 R_1	18 MHz	Fullband G, B, R and Key signal with 0/1 meaning even respectively odd samples

HiRes 1440

Output interface equivalent to EBU TECH 326 E / SMPTE 125 M - 1992

	Link A	Link B	Sampling Frequency	Notes
● 8:4:4	Y0 C_{R0} C_{B0}	Y1 C_{R1} C_{B1}	27 MHz	Even luminance with halfband filtered even chrominance. Odd luminance and halfband filtered odd chrominance.

SDTV outputs are switched off when a HDTV standard is selected and vice versa.

The main task of the digital signal processing part is encoding several output formats of the internal data format and driving the parallel and the serial output Links A and B at the terminal unit of Rack 3.

The serial data stream is 270 Mbits in SDTV and 8:4:4, respectively 360 Mbit/s in EDTV.

The parallel Links A and B and the serial Links A and B are always in the same operation mode.

A further task of this board is the digital preprocessing for the SDTV / EDTV / 8:4:4 monitoring output of the film scanner.

The monitoring signal is fed via the terminal unit to the analog monitor processing FY 1408 in Rack 2 and can be used to display the inputs, the main outputs or the internal RGB-matrix-outputs of the SDTV output board FY 6312.

SDTV Analog Output

Furthermore, the input signals before and after the RGB-matrix can be selected for the on-board analog processing. The analog outputs are looped to the terminal unit.

The following features are part of the analog output stage:

- D/A conversion of R,G,B and key channel, or Y,CR,CB and Key, switchable, but not both modes at a time.
- Output blanking in R,G,B, Y,CR,CB and key-channel according to analog blanking requirements in document CCIR 656.
- Analog output blanking can be switched on/off.
- Analog sync signal generation.
  The sync outputs are set to blank level for HDTV and data mode
- Two analog output sets, switchable between: both output sets R,G,B, or both output sets Y, CR, CB.
- Two analog output sets with Key signal
- Two analog sync signal outputs
- Additional analog sync signal in G-, Y channel, can be switched on/off
- Additional analog sync-signal in R-, B-, CR-,CB channel, can be switched on/off
- Analog outputs can be switched on/off
- Analog output level for R,G,B, or Y,CR,CB and Key is adjustable +/-10% from nominal level via pot by user

Analog output blanking

The data stream is blanked in the digital domain to provide correct timing of the analog video outputs (blanking period and blanking position).

The slewrate of the blanking signal is limited to 4 clocks.

D/A conversion

A 10-bit D/A-converter is used for generating the analog R,G,B,Y,CR,CB and Key signal.

Lowpass filters with 1/si correction provide post-filtering according to the selected standard.

For SDTV signals, a filter according to CCIR 601 is used.

For EDTV signals, a scaled filter according to CCIR 601 is used with a scale factor of 4/3=1.333.

In 8:4:4 mode, the EDTV filter is used for filtering.

HDTV Output Digital (Option)

HOD FY 6313

The video data Y, C_R, C_B and K is transmitted from TV Store FY 6310 to the input of the HDTV Output Digital Board FY 6313 in four channels.

Each channel contains a 10 bit data stream, the sampling and clock signal frequency is according to the standard:

- 1125 lines / 60.00 Hz, interlaced, 74.25 MHz sampling frequency
- 1125 lines / 59.94 Hz, interlaced, 74.18 MHz sampling frequency
- 1250 lines / 50.00 Hz, interlaced, 72.00 MHz sampling frequency, 36 MHz clock frequency
- 1920x1080 / 60.00 Hz, interlaced, 74.25 MHz sampling frequency
- 1920x1080 / 59.94 Hz, interlaced, 74.18 MHz sampling frequency

and with option FH1635 DTV

- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive
- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive
- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1

The following standards are prepared:

- HiRES 1440 - 525 lines / 59.94 Hz, interlaced, 27.00 Mhz sampl. frequ. (8:8:8)
- HiRES 1440 - 625 lines / 50.00 Hz, interlaced, 27.00 Mhz sampl. frequ. (8:8:8)

The board provides the output signals Link A, Link B (Digital HDTV Out) and the data stream (R, G, B, K or Y, C_R, C_B, K) for the HDTV Output Analog Board FY 6314.

Further tasks of the FY 6313 board are:

- Converting data stream to RGB by a dematrix stage
- Optionally halfband filtering for the signals C_R and C_B
- Static rounding data stream from 10-bit to 8-bit signals optional (e. g. for film to tape transfer and using for 8-bit devices)

The output signals Link A and Link B as well as the four channel data streams to the HDTV Output Analog are according to the HDTV standards EU95, SMPTE 260M and SMPTE 274M as listed in the following table:

HDTV	Link A	Link B	Notes
● 2* 4:2:2	Y C_R C_B	Y C_R C_B	C_R / C_B halfband filtered
● 4:4:4:4	Y C_{R0} C_{B0}	K C_{R1} C_{B1}	
● 4:2:2:4	Y C_R C_B	K - -	C_R C_B halfband filtered
● 4:4:4:4	G R	K B	
● 4:4:4:4	G B_0 R_0	K B_1 R_1	with 0 / 1 meaning even respectively odd samples

Prepared standards

HiRes 1440	Link A	Link B	Note
● 8:8:8	Y C_R	(K) C_B	for future use
● 8:8:8	G R	(K) B	for future use

The digital outputs are led to the terminal unit of Rack 3.

The pinning of the 50 pin socket used for LINK A / B (Digital HDTV Outputs) is made according to CCIR TG 11 standard.

CCIR Link A or B - Y C_R C_B / J 27 or J 28

50-pin Cannon female.
Digital parallel interface for the HDTV Y/C signal 4:2:2 or 4x4 (details see chapter 5.4.2.2 HDTV Out)

The electrical specifications of the Video Data I/O connector are according to EU-95 standard.
Mechanical pinning according to CCIR Documentation TG 11/1 - TG 12/1, see chapter 5.4.2.2 Figure 530.

Digital Serial Out

HD Serializer HD10SR
The HDTV Serializer convert the HDTV parallel signal LinkA/B at Rack 3into a serial digital signal according to SEMPTE 292M standard and in the 4:4:4 or 2x 4:2:2 coding format.

Coding and Data format

Details of the video data connector CCIR Y/C

TV Standard	Coding + Data format	Clock
1250/50	CCIR TG 11/1-11/2 or EU 95-PG02/03	36 MHz
1125/60	SMPTE 260M	74.25 MHz
1125/59.94	SMPTE 260M	74.18 MHz
1920 x 1080 / 50 2:1 *	SMPTE 274M	74.25 MHz

1920 x 1080 / 59.94 / 2:1	SMPTE 274M	74.18 MHz
1920 x 1080 / 60 / 2:1	SMPTE 274M	74.25 MHz
1920 x 1080 / 23.98 P *	SMPTE 274M	74.18 MHz
1920 x 1080 / 24 P *	SMPTE 274M	74.25 MHz
1920 x 1080 / 25 P *	SMPTE 274M	74.25 MHz
1920 x 1080 / 23.98 sF *	SMPTE 274M	74.25 MHz
1920 x 1080 / 24 sF *	SMPTE 274M	74.25 MHz
1280 x 720 / 59.94 P *	SMPTE 296M	74.18 MHz
1280 x 720 / 60 P *	SMPTE 296M	74.25 MHz
* = only with option DTV		

See also chapter 5 "Connection of external Equipment Rack 3" in this manual.

Moreover, an additional digital data output is provided for the optional Monitoring board FY 1408 within Rack 2.

The following signals are selectable for monitoring:

R, G, B, Y, C_R, C_B, K, Link A (M or L), Link B (M or L), RGB or Y C_R C_B line multiplexed.

HDTV Output Analog (Option)

HOA
FY 6314

The HDTV analog output board contains D/A conversion, filtering and analog blanking.

The board supports the following output Standards:

- 1125 lines / 60.00 Hz, interlaced
- 1125 lines / 59.94 Hz, interlaced
- 1250 lines / 50.00 Hz, interlaced
- 1920x1080 / 60.00 Hz, interlaced, 74,25 MHz sampling frequency
- 1920x1080 / 59.94 Hz, interlaced, 74,18 MHz sampling frequency

  and with option FH 1635 DTV
- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive
- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive
- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1

The following standards are prepared:

- HiRes 1440 - 525 lines / 59.94 Hz, interlaced, 27.00 MHz sampl. frequ. (8:8:8)
- HiRes 1440 - 625 lines / 50.00 Hz, interlaced, 27.00 MHz sampl. frequ. (8:8:8)

Functions

The HOA board receives digital video input data via 4x10-bit data streams from the HOD board either in G B R K or Y C_B C_R K components.

The HOD board also provides the clock according to the selected standard and each data stream contains the sync information of the selected standard.

- **D/A conversion of R,G,B or Y,CR,CB and key channel**
  A 10 bit D/A converter is used for generating the analog R,G,B or Y,CR,CB and key signal.
  Lowpass filters with 1/si correction provide postfiltering according to EU95 PG02 / PG 03 Nov. 92
  The board is prepared to take a second analog filter bank for example for analog filtering according to SMPTE 260 M - 1992 or HiRES 1440.

- **Output blanking in R,G,B or Y,CR,CB and key channel**
  The data stream is blanked in the digital domain to provide correct timing of the analog video outputs (blanking period, active video).
  The slew rate of the blanking signal is limited to four clocks. The transition of active video signal to blanking level is following a sine function, with four in-between steps.
  This function is performed on the five MSB of data only, while the 5 LSB are switched to zero during transition.

- **Analog sync signal generation for every selectable standard**
  The sync pulse is generated by a pulse generation stage, defining the start of sync pulse and the waveform, dependent on the selected TV standard.
  The digital 10 bit wide signal is converted by a D/A converter and added to the analog output signals if the sync addition is selected via RSCI. Sync on Green and sync on Red/Blue can be switched on/off independently.
  The sync output is trilevel +/- 300 mV / 75 Ohm for HD and bilevel 2 V / 75 Ohm for non HDTV standard.

- **Two analog output sets with R,G,B or Y,CR,CB and key signal**

- **Two analog sync signal outputs**
  The generated analog sync signal is available two times at the board output.

FY 6345
Data Output

FH 6335
HIPPI Serial I.F.

Data Output HiPPI I.F.

The Data Output Board FY 6345 is designed to provide high-speed film data - DPX HIPPI format - for recording on computer workstations.

The HiPPI serial interface provides a high-speed data transmission via fibre optic cables. A cable length of up to 500 m is possible.

Both units are part of the option "Phantom Transfer Engine TE 2101"

FY 6385
Data Output

Data Output GSN TransferEngine TE 2111 /TE 2111HG

The Data Output Board FY 6385 is designed to provide high-speed film data - DPX GSN format - for recording on computer workstations.

1.3.4.5 Motor Servo System

The two motor servo systems of the film scanner consist of the following units:

1. Film spooling servo
   with Tension Levers (left & right) FH 1048 / 1049, Spooling Power Stage FH 1025 (UL Version) and two Spooling Motors FH 6001.
2. Capstan servo
   with Sprocket Wheel Pulse Tacho FH 6018, Capstan Control & Sprocket Pulse Generator FY 6202, Capstan Power Stage FD 2 ST9A and Capstan Motor FD MO 9 - 004.

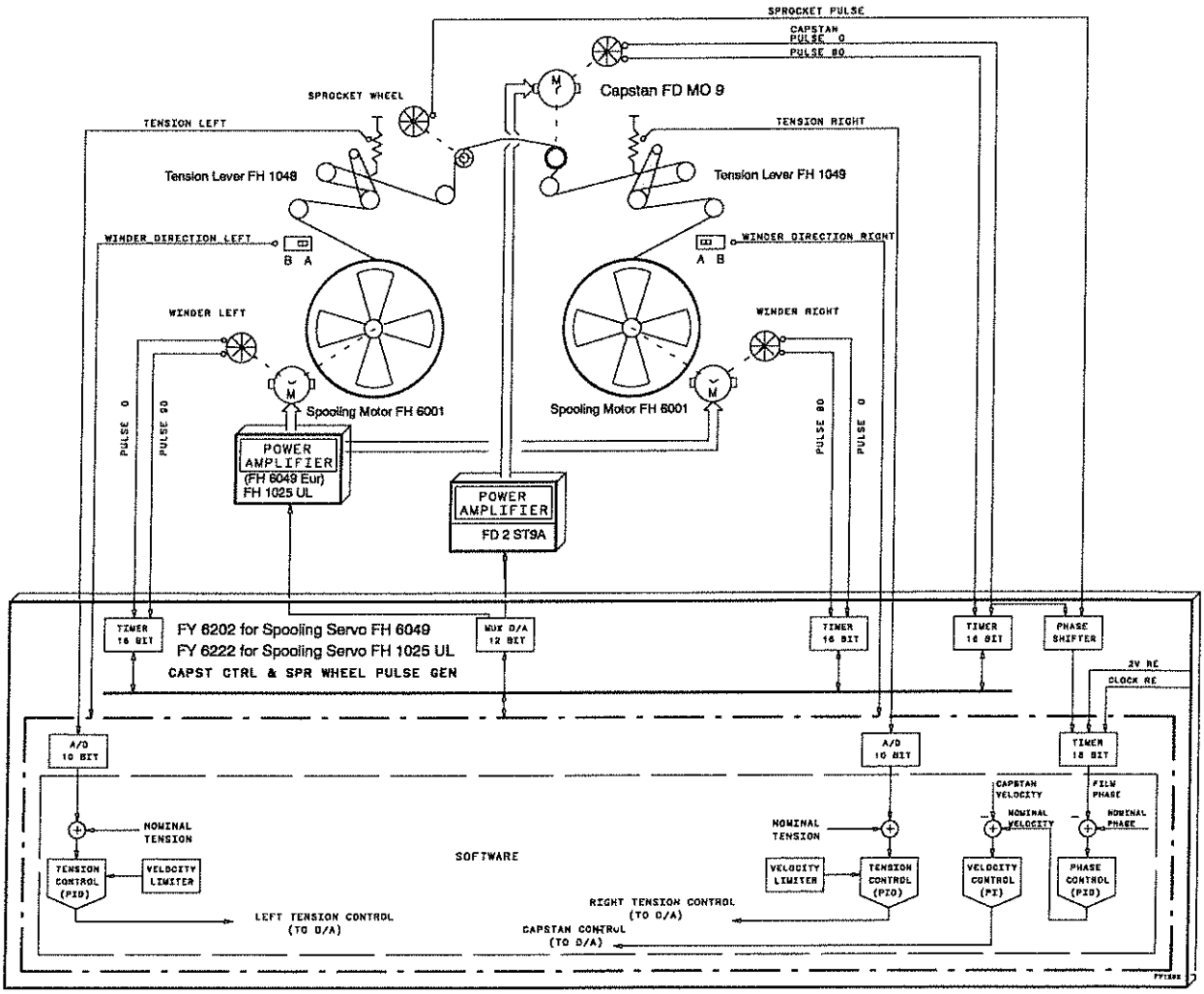


Fig. 111:

Film Spooling Servo

The spooling servo controls the film tension and the winder speed of rotation. It provides constant film tension in any operation mode.

The position of the tension levers left & right is proportional to the film tension and causes an additional control voltage in the spooling motors in case of tension deviation, in order to return the tension arms to the initial positions and thus, to keep the film tension constant.
Upon power failure, film brake and activated end-of-film switch, a separate spooling brake control provides film saving conditions.

Capstan Servo

The computer-controlled capstan servo controls the film motion in any mode of operation. The film is transported continuously by a rubber-coated wheel, driven by the capstan motor, started, stopped, and controlled in its speed and phase.

If the film transport is synchronized with the V pulse from the Genlock Generator FY 6338, the light-emitting diode CAPSTAN LOCKED on the Capstan & Sprocket Pulse Generator FY 6202 indicates the locked condition.

1.3.4.6 CONTROL PANELS

Local Control Panel FH 6500

The Local Control Panel is the standard control device for basic operation of the film scanner.

It provides the film transport functions Play, Shuttle, Step, Stop and Standby as well as FPN correction, coarse framing adjustment for 35mm films and Local / Remote selection.

The module is connected to the Filmdeck Controller Board FDC in Rack 2 via I^2C - bus.

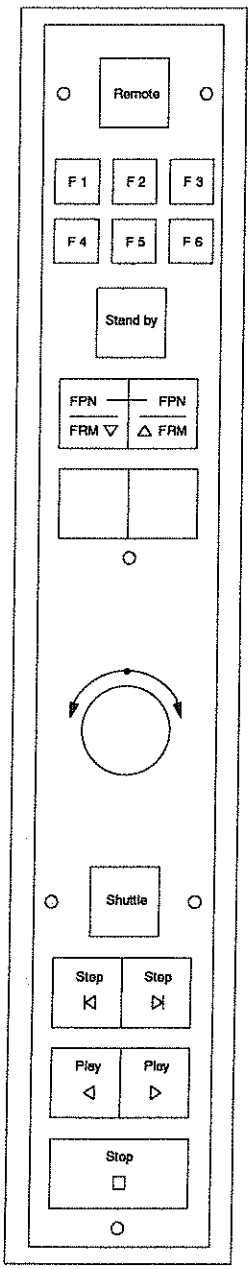


Fig. 112:

Graphical Control Panel

The highly sophisticated Graphical Control Panel GCP1 is designed to control the Spirit DataCine SDC 2002.

It provides equal functionality as the former Control Panel FCP1 and can be used for film scanner setup and maintenance.

Overview Control and Display Elements

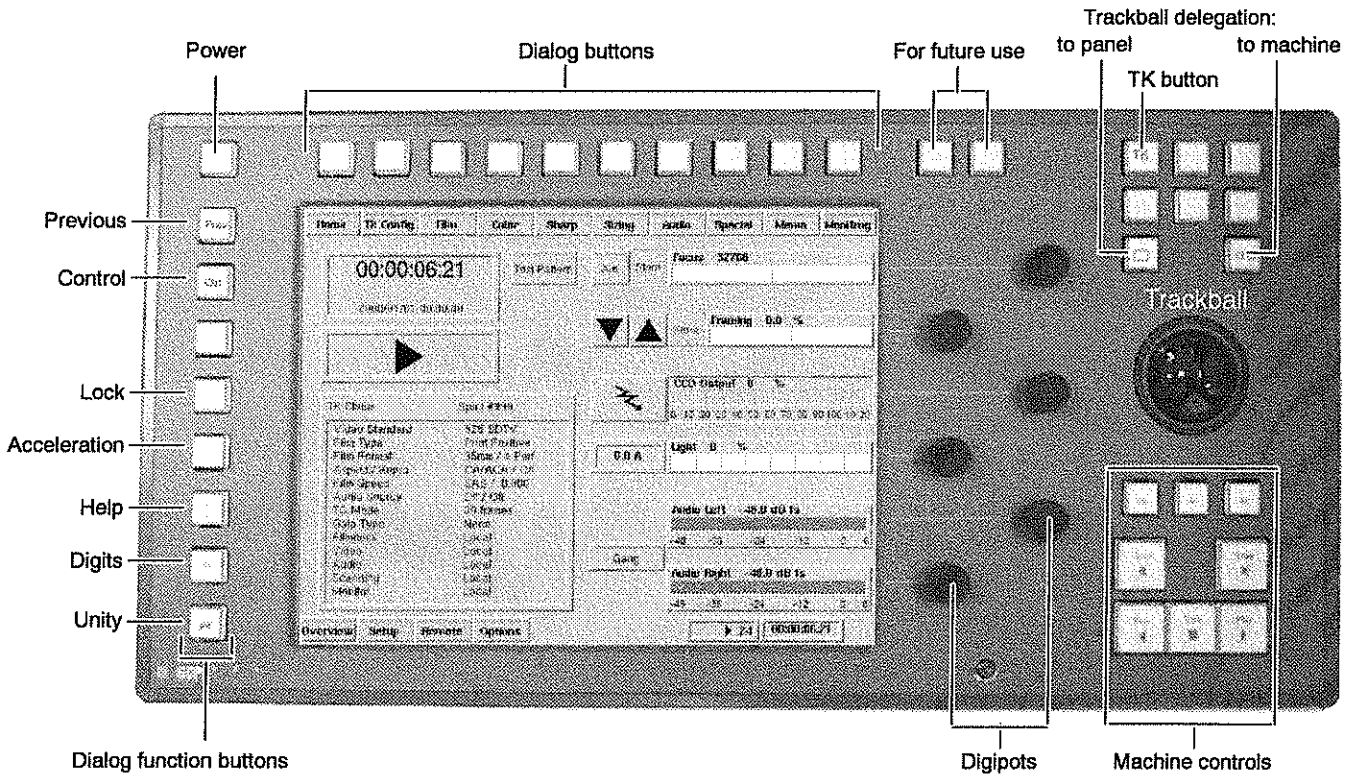


Fig. 113: Control panel GCP 1

The full feature Graphical Control Panel (GCP) of the film scanner is hinged and can be operated swung out in different positions.

The panel can be used as a remote control panel (maximally 15 m). It is connected to the film scanner via the internal machine communication system (iMCS).

The control panel serves for control and indication of the controlled functions. The operating elements are arranged in groups to facilitate operation. Ten main menus can be directly selected with the dialog buttons or by means of the touch screen.

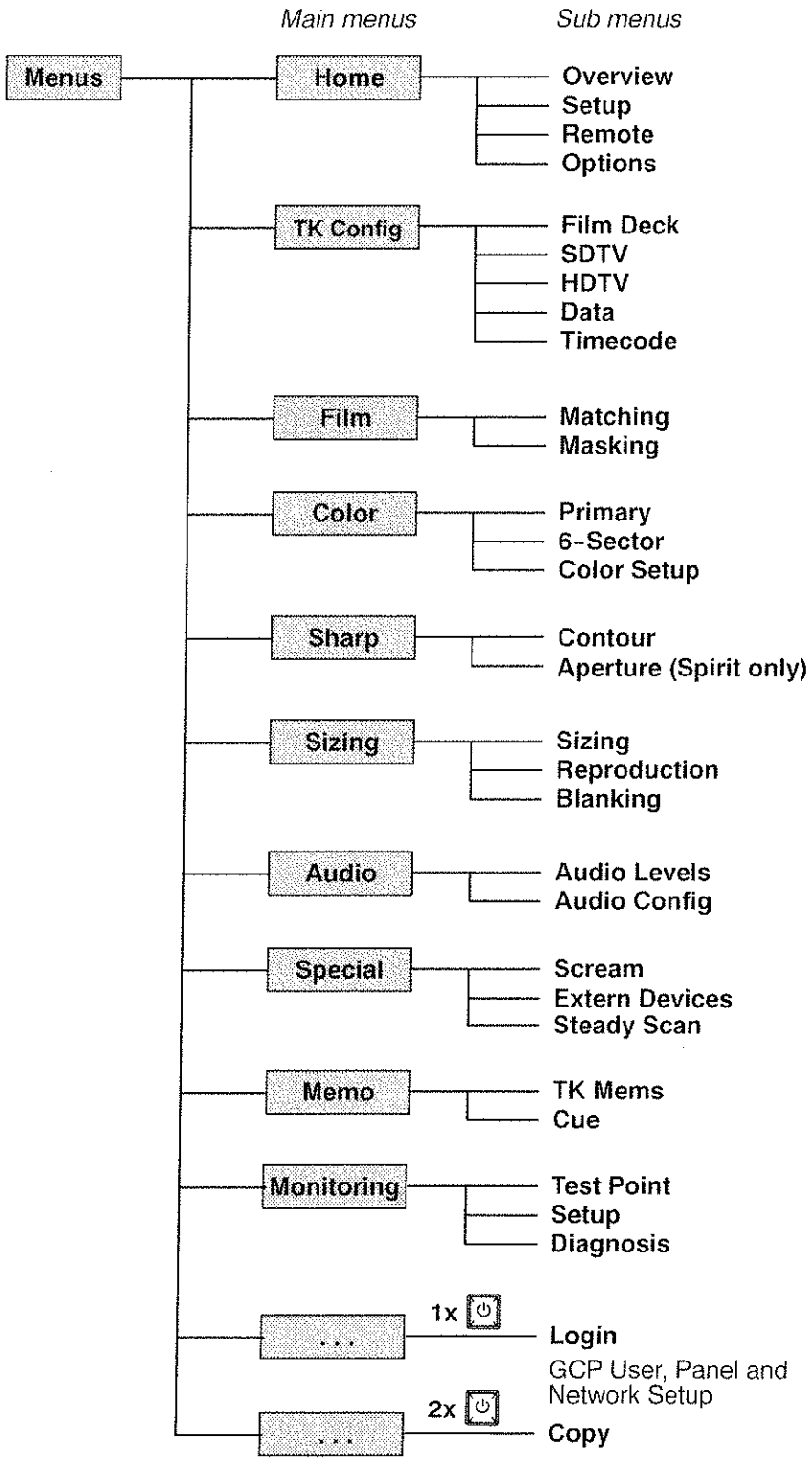


Fig. 114: Menus of GCP

After selection of a menu, the corresponding function key layout is displayed together with the default settings and operating conditions of the machine. The graphic display gives a clear view of the operating status of the film scanner. In addition, the display shows the current menu descriptions, the user and the diagnostic messages.

All standard filmdeck modes can be selected with keys. A trackball is provided to select variable machine speeds. For the film transport function, a separate control pad (Machine Controls) is provided with diverse function keys.
Analog settings are made with digipots with different functions in the individual menus. The window technique used in the menus ensures fast access to all operating functions. An AC power supply unit is integrated in the housing of the panel.

The panel can be installed into a desk or rack mountable frame with swivelling mechanism. The appropriate Thomson table or rack mounting set is required.

Desktop Mounting

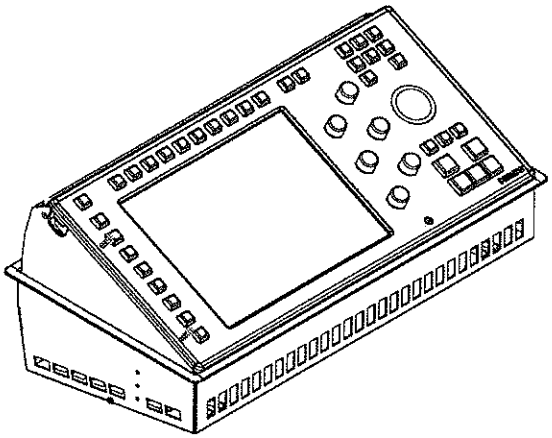


Fig. 115: GCP desk mounting version

Rack Mounting

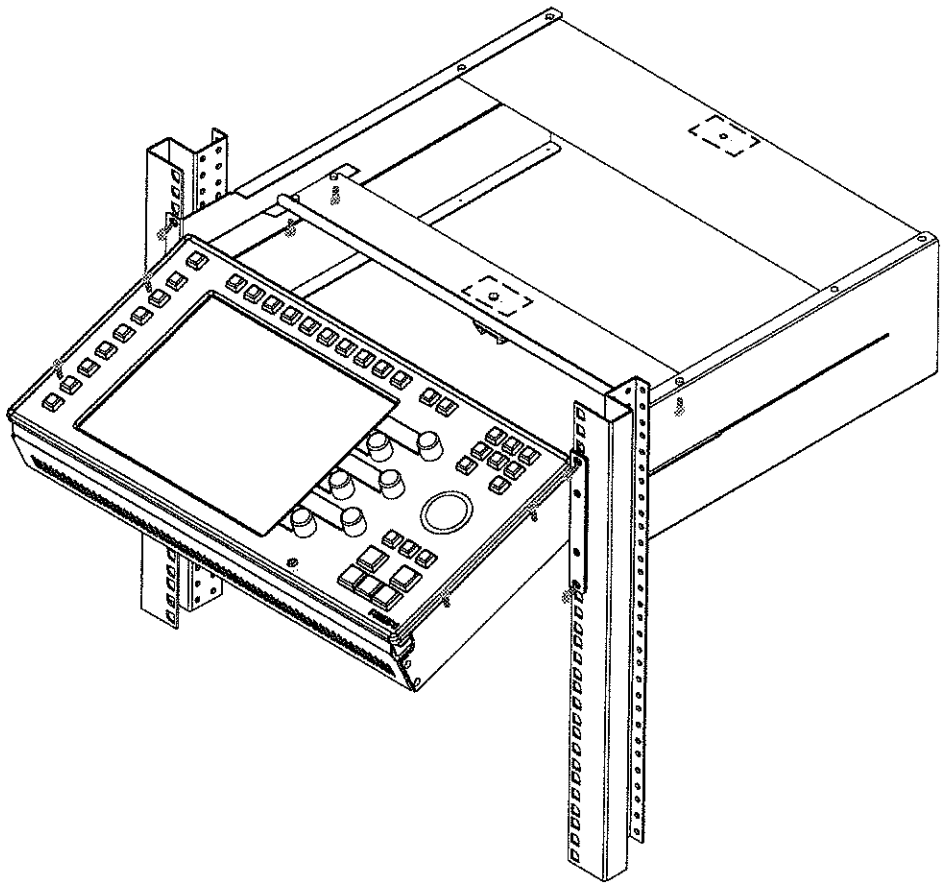


Fig. 116: GCP 19" rack mounted

1.3.4.7 Control Systems (Local & Remote)

The graph below shows the principle of the film scanner control systems.

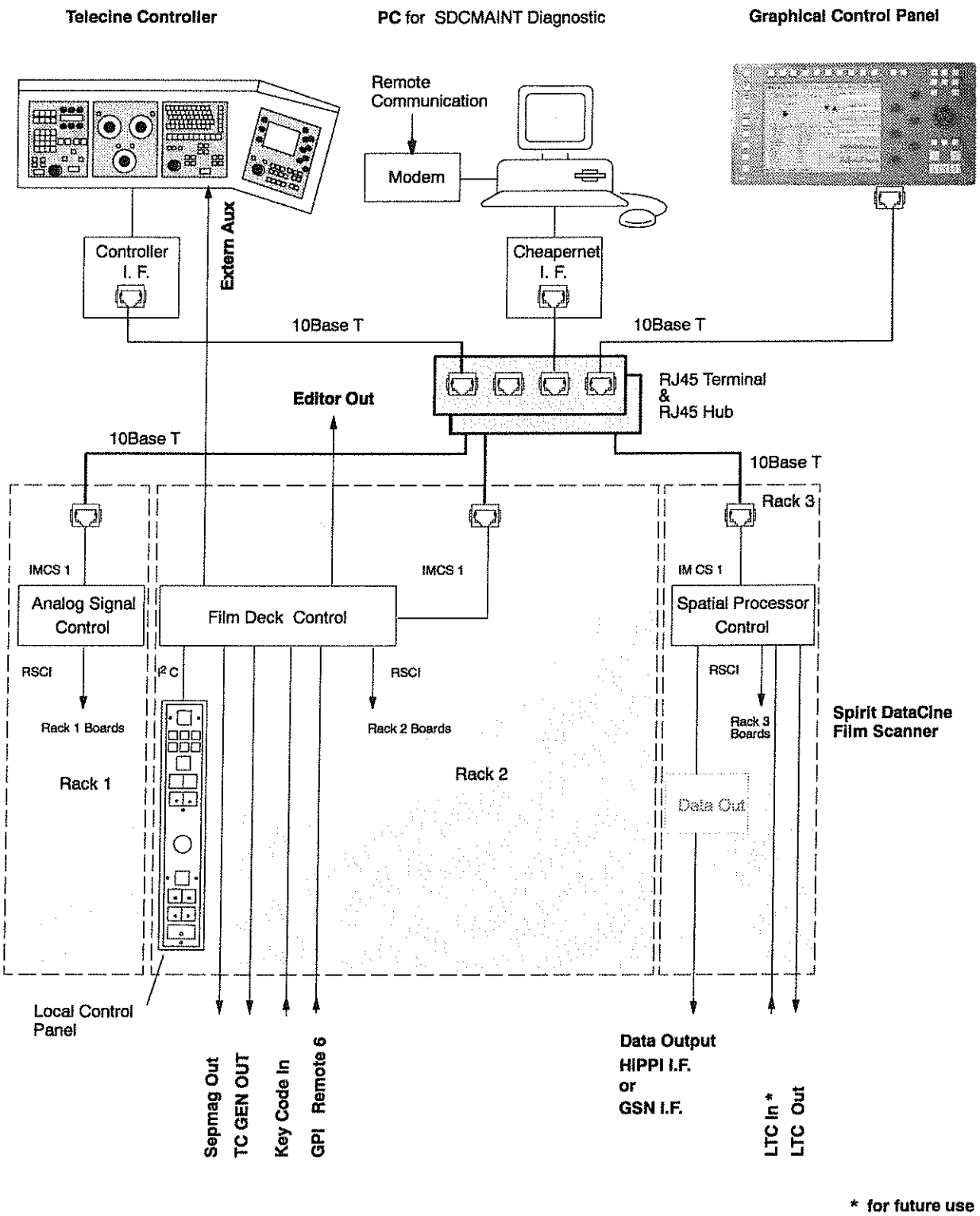


Fig. 117:

iMCS

The main components of the control system are connected with each other via the serial real time bus system iMCS (internal Machine Control System).

The control system is based on standard IEEE 802.3 (Ethernet). However, because the transmission cable deviates from the Ethernet standard, the cabling system is known by the name **10Base T Ethernet**.

The participants in the IMCS 1 system are:

Rack 1	Analog Signal Control
Rack 2	Filmdeck Control
Rack 3	Spatial Processor Control
GCP1	Graphical Control Panel

Various telecine controllers, a diagnostic PC with software option SDCMAINT and the Steadiscan Unit can be accommodated within the IMCS 1 net.

RSCI

The communication within the Racks 1 - 3 is done by a Rack Serial Control Interface **RSCI.**

The respective process control unit (ASP, FDC, SPC) of each rack controls and checks the accompanying boards via RSCI.

I^2C Bus

The Local Control Panel is connected to the Filmdeck Controller FDC via an I^2C bus.

It provides basic operation of the film scanner.

Remote LAN

For future use!

Serial RS 422

For future use!

Parallel GPI

The GPI (Remote 6) interface is integrated in the Filmdeck Controller Board FDC.

2. TECHNICAL SPECIFICATIONS

Note!
Specifications apply after a warm-up time period of 15 minutes.

2.1 GENERAL

2.1.1 DEVICE CATEGORY

The Spirit DataCine Film Scanner is suitable for stationary studio operation.

2.1.2 ENVIRONMENT

Recommended	Air-conditioned or ventilated; dust-free room		
Temperature	**Operation:**		+10° C to 35° C
	Storage:	with Lens Gate Assy	+10° C to 40° C
		without Lens Gate Assy	-10° C to 40° C
	Specifications apply after a warm-up period of 15 minutes		
Rel. Humidity	Storage and operation without condensation		10% to 80%
	Specifications apply to a range of		40% to 60%
Ventilation	The ventilating air stream enters through openings in the bottom frame of the film scanner cabinet. The outgoing air leaves the cabinets on top. Air filter mats protect against dust.		
Required air quantity	At 20° C ingoing air temperature		900 m^3/h (32 000 ft^3/h)
Safety regulations	Electrical equipment		
CE	• Low voltage directives		73/23/EEC
	Safety of information technology equipment		EN 60950 (VDE 805) (IEC 950)
	• Mechanical equipment		DIN 31000

c UL E184475

- Standard for Safety — UL 1419

Interference emission

CE

- Electromagnetic environment E2 and E4 — EN 55 103-1
- Electromagnetic emission — EN 55 022 class B

Interference immunity

CE

- Electromagnetic environment E2 and E4 — EN 55 103-2

Electromagnetic immunity	EN 61000-4-3
Electrostatic discharge	EN 61000-4-2
Electrical fast transient (burst)	EN 61000-4-4
Surge immunity test	EN 61000-4-5
Immunity to conducted disturbances	EN 61000-4-6
Voltage dips	EN 61000-4-11

Comment:
According to the valuation criterion B, test pulses in conformity with standard EN 55-103-2 may cause minor picture interferences at the analog SDTV output. In addition, disturbances in synchronism may occur at the outputs Sync Out (J37), SDTV Sync Out (J 40), Pulldown Out (J17) and FRS Out (J18). After decay of test pulses, there will be no impairment of operation.

Attention!
Conformity to the EMC regulations is only assured with closed Spirit DataCine rear doors during operation.

Interference emission

FCC 47 Part 15 Sec 15.105

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

N4067 — EMC — AS / NZS 3548

Noise Emission — weighted according to DIN 45633 Part 1 — Typical 56 dB (A)

2.1.3 MECHANICAL DIMENSIONS

Film scanner cabinet		
	Width:	1360 mm (53.55 in)
	Height:	1940 mm (76.38 in)
	Depth:	804 mm (31.65 in)
	Weight:	approx. 595 kg (1314 lbs)
	Ground load	531 kp/m^2 (109 lbs/sq.ft.)
	Peak area load	<16 kp/cm^2 (<227 lbs/ sq.in)
Transport crate	Width	2120 mm (83.46 in)
	Height	1050 mm (41.33 in)
	Depth	1550 mm (61.02 in)
	Weight	approx. 150 kg (331 lbs)

2.1.4 MAINS CONNECTION

Mains supply	3-phase current **(UL approved)** K-type fuse required	3 x 208 V, 60 Hz
	or 3 phase current (not UL approved)	3 x 400 V, 60 Hz
	or optional 2-phase current **(UL approved)** K-type fuse required	2 x 208 V, 60 Hz
	or optional 1-phase current (not UL approved)	1 x 230 V, 50 Hz
	Note for Japan! 3-phase current 3 x 175V, 60 Hz not supported. Use 3-phase current 3 x 350 V, 60 Hz!	
Power consumption	Typically	approx. 5.5 kVA
	3 Phases 208 V = 19A / 17A /12A	
	3 Phases 400 V = 10A / 9A / 6A	
	2 Phases 208 V = 25A	

2.2 FILM TRANSPORT SYSTEM

Film size format

16 mm, S16 mm
FA (Super) 35mm & 35mm in 2, 3 &4-perf
S 8 mm optional

Film types

- Color Print
  B/W positive; B/W negative; Color positive
- Color Negative
- Intermediate
- Prime Time

Film transport

- Direct servo-controlled capstan drive
- Feed and take-up spooling servo controlled to provide constant film tension

Fixed speeds

Full resolution in forward and reverse mode

25, 12 $^1/_2$, 6 $^1/_4$ fps	at 625 lines / 50 Hz
29.97, 23.98, 17.98, 11.99, 5.99 fps	at 525 lines / 59.94 Hz

Reduced vertical resolution in forward and reverse mode

57 fps	all standards

Select-a-speed

- 2.00 to 57.00 fps in forward and reverse (35 mm - 4perf)

Stop mode

- Frame-accurate in full quality
- Spatial and color processing still possible

Variable visible search

With full-size picture in a range of

2 fps to at least 150 fps **for 16 mm**
2 fps to at least 75 fps **for 35 mm**

Upper limit adjustable to 600 fps for 16 mm and 240 fps for 35 mm

Step mode

Single step forward and reverse with full resolution

Run-up time

to 25 or 24 fps

• Unlocked but correct speed	< 0.2 s
• Locked to correct speed within	1.8 s

Picture stability

35 mm-4-perf	Better than	± 0.05 %
	of full frame height / width for 35 mm 4-perf	
16 mm	Better than	± 0.14 %
	of full frame height /width for 16mm film	

Framing adjustment

- - 60 % ... + 60 % of total frame height

Film capacity

on spools :	Capacity with 16 mm and 35 mm DIN or ANSI spools (diameter 54 cm),	Up to 1200m (3937 ft.)
on cores :	Capacity with DIN- or ANSI- cores (diameter < 44 cm)	Up to 900 m (2952 ft.)

A/B wind Switch for clockwise and counterclockwise winding

Film switch Stops film in shuttle before running from the spool / core

2.3 ILLUMINATION AND FILM SCANNING SYSTEM

2.3.1 LIGHT SOURCE AND CONDENSER

Xenon lamp

- Optical feedback controlled for constant intensity
- 300W, short arc type
- Elapsed time meter

Optical matching filters

- Four selectable filters for PRINT, NEG, INTERMED and "PRIMETIME"

Fast aperture

- Attenuation of at least 3 stops of illumination within 42 ms

Integrating cylinder Diffused illumination system for shading and scratch reduction

2.3.2 CCD SCANNER

Lens / Gate assemblies (LGA)	Three different lens / gate assemblies are possible, each consisting of projections lens, condensing optics, integration film block and film gate. The two different types of Lens / Gate Assemblies available are: ● Full Aperture 35mm Lens / Gate Assembly ● Super 16mm Lens / Gate Assembly	
Film gate	● Interchangeable with automatic detection ● Fast lock for easy cleaning ● FA 35mm LGA may be equipped with a 35mm gate block (option) ● S 16 mm LGA may be equipped with a 16mm gate block (option) or in combination with the S8 mm option	
Gate blast - strongly recommended!	● Connector and hose provided for externally supplied compressed air to keep gate and integration cylinder clean from dust.	
Focus control	● Remote mechanical focus control	
CCD pickup device	● Kodak Color Tri-Linear Sensor with RGB dichroic filters each 960 photosites. ● Kodak Color Detail Quad-Linear Sensor with 1920 photosites in total	
Preamplifier	switchable gain, not frame-by-frame programmable	0 dB / + 6 dB
X-Y Zoom	● Typical area magnification for SDTV ● Independent X and Y sizing possible ● X - Y panning and repositioning ● Anamorphic unsqueeze 2:1	0.1x to 16x
Geometry and linearity	Better than	0.5% of picture height
White shading	Automatically compensated to	≤ 0,8 % (at 100% signal level and γ = 0.4)

Aperture correction:

- H and V inband in relation to film
- -6 dB ... +3 dB at peaking frequency
- Peak frequency adjustable
- Coring adjustable

Contour correction

- H and V, TV-related
- > -12 dB....+8 dB at peaking frequency
- Peak frequency adjustable
- Coring adjustable

2.4 VIDEO

TV standards

625/50, 525/59.94	2:1 interlace	CCIR 601
4:4:4:4 or 4:2:2:4 or 8:4:4 10-bit digital		CCIR 656

Display formats

4:3 and 16:9 full screen
and horizontal / vertical letterbox

Masking

- Choice of preset masking equations for different film stocks
- Linear (MATRIX) or logarithmic (MASKING) depending on selected film stock

System timing adjustable

Vertical:	1 frame
Horizontal:	1 TV line

Signal / Noise ratio

Measured at 50% video level,
gamma = 0.4,
The ratio being 700mV divided by r.m.s. noise voltage

for	luminance	> 60 dB
	red	> 55 dB
	green	> 58 dB
	blue	> 55 dB

Video resolution

FA 35 mm: not more than 2 dB down at 400 lines in center and corner.
(film losses not taken into account)

Digital color correction

Matching	RGB-Gain	
	RGB-Black	
Black	MASTER	
	RGB	
White	MASTER	
	RGB	
Gamma	MASTER	
	RGB	
	CRT	1.00 / 0.45
Extended Ranges	Lift Master	-100% +100%
	Lift RGB	-100% +100%
	Gain Master	0% - 1000%
	Gain RGB	0% - 1000%
	Gamma Master	0 - 2.5
	Gamma RGB	± 60% of Master Range
CR-Saturation	Continuous variable adjustable	0% 200%

Digital Blanking

- Control of size, H- and V-position
- Adjustable full frame horizontal / vertical
- Fixed wide-screen blanking

Effect Filter Kit

Effect filters positioned in the optical path between the projection lens and the CCD sensors

Filter Support	14 filter drawers, equipped with Supermist filters 6 empty filter drawers and 6 filter hold-downs	
Filter types	white Supermist	1/4, 1/2, 1, 2, 3, 4, 5;
	black Supermist	1/4, 1/2, 1, 2, 3, 4, 5;
	optical flat	2 filters

2.5 CONTROL SYSTEM

Basic Local Control

Implemented in the film scanner cabinet. Offering basic functions to load the film such as:

STAND BY ON/OFF

FPN correction

A/B wind

FRAMING

PLAY FWD/REV

STEP FWD/REV

STOP

SHUTTLE FWD/REV

LOCAL/REMOTE

POWER ON/OFF

Functional Control Panel

Full service or "one light transfer" control of all functions, to be mounted separates from the film scanner

Dimension: Height 5 Rack Units
223 mm (8.78 in)

Telecine Controller

Interface to a Pandora or DaVinci telecine controller / programmer / editor (standard operation control)

2.6 WAVEFORM MONITORING

Application

- Color grading in RGB
- Focus adjustment
- Video path checking (except MTF measurements)

Features

- Monitoring of the color signals inside the digital signal processing and at the outputs.
- Single, parade or superimposed display

Waveform monitors

supported monitors for interfacing:

- Philips PT 5464 HD
- TEK 1735 HD
- TEK 1730 HD
- TEK MFM 300
- TEK WFM 300A
- Philips PM 5664

Maximum cable length

- Nokia 0.6/2.8/4.7 double shielded: up to 5 m /AF/75 Ω
- Nokia 1.0/4.7/7.4 double shielded: up to 20 m /AF/75 Ω

For cable lengths more than 25 m, cable equalizers are recommended.

Control

Testpoint selection, channel selection and display defining is made via cheapernet interface.

2.7 INPUT / OUTPUT INTERFACES

iMCS	• 4 x RJ45 / 10BaseT connectors	
	• 1x BNC (internal hub)	
	• Standard EEE 802.3	
	• RJ45 terminal plus internal hub for up to 4 remote panels or telecine controllers	
	• Cable length:	< 150 m
FRS OUT	• BNC	
	• FREEZE SIGNAL marking repeated fields,	TTL - Pulse
	• Polarity configurable	
CFR IN	Input used for synchronization of the film scanner to a controller / programmer / editor (pulldown, fixed speed sequences)	TTL - Pulse
CFR OUT	Output used for synchronization of a telecine controller / programmer / editor (pulldown, fixed speed sequences)	TTL - Pulse
SEPMAG OUT	• Sepmag interface	
	• D-sub 9-pin female	
	• Configurable to 10 x Bi Phase (250 / 240 Hz) or 2 x Bi Phase (50 / 48) 1 x Bi Phase (25 / 24)	
EXTERN AUX	• Telecine controller interface	
	• 25-pin sub-D, female	
	• SOF_Film, SOF_Studio (FRID), FWD/REV, ..	
LTC OUT	• Linear time code interface compatible to SMPTE 12M standard	
	• XLR male connector	
Extern Keycode In	• Keycode reader RS 232 interface for insertion of key code information into SDTV output, LTC-out, VITC.	
	• D-sub 9-pin female; details see chpter 5.4	

2.7.1 VIDEO

DIGITAL VIDEO OUT	• CIR 656 LINK A / B • D-sub 25-pin, female parallel and BNC serial • 4 : 2 : 2 or 4 x 4 format • 8:4:4 • Y, C_B, C_R, K
ANALOG VIDEO OUT	• BNC • R, G, B, S, K or Y, C_B, C_R, S, K
EXT REF	BNC input for ext. reference sync

2.7.2 AUDIO (optional)

DIGITAL OUT 1/2	XLR male	channel 1,2	(AES/EBU format)
ANALOG IN 1	XLR female	balanced audio input channel 1	
ANALOG IN 2	XLR female	balanced audio input channel 2	
ANALOG OUT 1	XLR male	balanced audio output channel 1	
ANALOG OUT 2	XLR male	balanced audio output channel 2	
SR IN 1	XLR female	balanced Dolby-SR/SRD-audio input channel 1	
SR IN 2	XLR female	balanced Dolby-SR/SRD-audio input channel 2	
SR OUT 1	XLR male	balanced audio output to a Dolby-SR processor channel 1	
SR OUT 2	XLR male	balanced audio output to a Dolby-SR processor channel 2	

MONITOR L	XLR male	balanced audio output to an active speaker, left channel
MONITOR R	XLR male	balanced audio output to an active speaker, right channel

Audio Ref Audio synchronization

48 kHz IN BNC, female,
48 kHz clock input to synchronize the audio processor with external digital audio components

48 kHz OUT BNC, female,
48 kHz clock output to synchronize external digital audio components

2.7.3 WAVEFORM MONITORING

ANALOG OUT	BNC: For waveform monitoring only!	R, G, B, S
CTRL	D-sub15-pin female connector for remote control of waveform monitor or vectorscope Maximum cable length: 50 m (150 feet)	

2.8 OPTIONS

2.8.1 AUDIO

Audio format:	COMMAG 16 mm,	MONO
	COMOPT 35 mm,	MONO/STEREO
	COMOPT 16 mm,	MONO

Inputs:

Input	Level	Impedance
ANALOG IN 1, L ANALOG IN 2, R balanced, floating	LEVEL switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level	> 10 kΩ
SR IN 1 SR IN 2 balanced, floating	LEVEL switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level	> 10 kΩ

Outputs:

Output	Level	Impedance
ANALOG OUT 1 ANALOG OUT 2 balanced, floating	LEVEL switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level	< 40 Ω
MONITOR L MONITOR R balanced, floating	LEVEL switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level volume control off to +6dB	< 40 Ω active speaker required
SR OUT 1 SR OUT 2 balanced, floating	LEVEL switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level	< 40 Ω
DIGITAL OUT 1/2	5 Vpp	110 Ω

Test oscillator:

1 kHz and 10 kHz
-3 / 0 / +4 / +8 dBm switchable to ANALOG OUT

Frequency response:

1 kHz reference, 10 dB below full level

COMOPT

16 mm	40 Hz ... 8 kHz	- 2 dB .. + 2 dB
35 mm	40 Hz .. 12.5 kHz	- 2 dB .. + 2 dB

Measured with comopt sound frequency test film according to DIN 15506

COMMAG

16 mm	40 Hz ... 12.5 kHz	± 2 dB

Measured with commag sound frequency test film according to DIN 15638 BF 16

S/N ratio

COMOPT

S/N ratio weighted (CCIR 468-4):

16 mm	> 52 dB
35 mm	> 60 dB

S/N ratio unweighted r.m.s:

16 mm	> 58 dB
35 mm	> 66 dB

Reference measured at full level (+ 6 dBu / + 9 dBu with 9 dB lead,+ 12 dBu / + 16 dBu with 8 dB lead),
film scanner running without film but comopt lamp switched on, measured with peak voltage meter according to CCIR 468-4.

Audio delay

Speed controlled digital audio delay for the compensation of the sound to picture offset.

2.8.2 DATA OUTPUT (PHANTOM TRANSFER ENGINE TE 2101 HIPPI I.F.)

System application

High-speed film data output for film processing and archiving

Data resolution (Image Size)

- Selectable
  horizontal: 256.....2048
  vertical: 256.....1832
- Presets
  1920 x 1080
  720 x 540
  720 x 405
- Fixed square pixel formats:
  1920 x 1080,
  720 x 540
  720 x 405

File format

- HIPPI FP ANSI x3.210 - 1992
- DPX format, according to SMPTE 268M-1994 (3x10-bit RGB, Cineon compatible)

  Thomson specific header information included

Transfer rate (Film speed)

Depending on system configuration and selected image size
e.g.: ~ 5 fps for 1920x1440 10-bit RGB pixel

Transport Protocol

- HiPPI FP Ansi X 3.210-1992
  only image data and file information, no control data

Data interface serial

- HIPPI-Serial (ANSI X.3.300-1997)
  32 bit (800 Mbit/s) configuration, dual simplex connection
  Transmission: 1.2 Gbit/s, 850 nm typ.;
  VCSEL light source;
  Signalling sequence and protocol compatible;
  HIPPI-PH ANSI X3.183-1991;
  Overhead bits OHI to OH7 not supported;
  Reception: link control, 770 to 860 nm center wavelength 0 to - 17 dbm optical power range;

  Optical Duplex SC Connector
  AEL Class I laser per EN 60825-1
  Transmitting distance up to 500 m with 50/125µm MMF cable.

2.8.3 TE 2111 / TE 2111HG - GSN Data Output / Spirit DataCine

• GSN Data

Image resolution	adjustable
horizontal	256 .... 2048 pixel
vertical	256 .... 1832 lines (35mm 4-perf)
presets	2048 x 1556, Full Aperture 35mm 4-perf 2048 x 1240, Super 16mm 1920 x 1080, HDTV 16:9 1920 x 1440, 4:3 1828 x 1332, Academy 35mm 4-perf 1712 x 1240, 16mm 1364 x 1024 1280 x 1024, SXGA 1280 x 960 1024 x 768, XGA 800 x 600, SVGA 720 x 540 720 x 405 640 x 480, VGA
File format	DPX according to SMPTE 268M-1994
Transfer characteristics	TV-Gamma, linear, logarithmic, printing density, user defined
Components & packing	4x8 bit, RGBA packed to 32bit, Alpha (A) = space("0") 3x10 bit, RGB filled to 32 bit with padding at bits 0 and 1 3x10 bit, Y-only filled to 32 bit with padding at bits 30 and 31 2x16 bit, Y-only packed to 32bit
Transport protocol	ST (Schedule Transfer) protocol ANSI NCITS 343-2001 only image data and file information

• GSN Interface

Type	GSN (Gigabyte System Network) interface High-Performance Parallel Interface ANSI NCITS 338-200x (HIPPI-6400-OPT) 12 separate full-duplex channels, signaling sequence and protocol compatible to ANSI NCITS 323-1998 (HIPPI-6400-PH)
Transfer rate	≥ 800 MB/s
Film speed	up to 30.00 f/s depending on system configuration and selected image size
Connector	12 fiber MPO
Transmitting distance	up to 200 m

• Monitoring

Display characteristics	selectable display LUTs (lookup tables)	
Resolution presets	1280 x 1024	SXGA
	1024 x 768	XGA
	800 x 600	SVGA
	604 x 400	VGA
Connector	mini D-sub 15-pin output	
VGA Cable	double shielded with ferrite cores maximum cable length 10m	

• Phantom Transfer Engine Software

storing and monitoring of digital image data sequences

Host requirements

- SGI Origin 2000
- 4 x 300 MHz R12K CPUs on 2 node boards (HUB chip Rev. 5 or higher) minimum
- Null router package for O2000
- 1 GB memory minimum
- SGI IRIX □ 6.5.16 or higher operating system
- 2 x Ethernet 10BaseT /100BaseT network interface
- 6 x Fiber Channel 1Gb links to 3 x striped fast disk arrays minimum (sustained rate >120MBps each)

GSN Input Phantom TE

- **1-slot SGI-XT-GSN board with copper interface**
- **SGI O2000 GSN EMI upgrade kit and bulkhead replacement**

or alternatively

- **SGI 2000 Package for Phantom TE GSN 1.9TB** - TE GSN SGI2000/O2
- **1-slot SGI-XT-GSN board with copper interface**

• Spirit DataCine SDC 2000/2001 System Requirements

- GCP Control Panel (e.g. GCP1 - 200)
- Reference Store FH 6612
- Spirit DataCine operation software version 3.96 or higher (FH 1643 kit is required below this revision)

• System Requirements

GSN switch with ports for optical to copper conversion and cabling

2.8.4 GSN DATA INPUT / PHANTOM TRANSFER ENGINE

- **Configuration**
  - SGI Origin 2000
  - 4 x 300 MHz R12K CPUs on 2 node boards (HUB chip Rev. 5 or higher) minimum
  - Null router package for O2000
  - 1 GB memory minimum
  - SGI IRIX □ 6.5.16 or higher operating system
  - 2 x Ethernet 10BaseT /100BaseT network interface
  - 6 x Fiber Channel 1Gb links to 3 x striped fast disk arrays minimum (sustained rate >120MBps each)

GSN Input Phantom TE

- **1-slot SGI-XT-GSN board with copper interface**
- **SGI O2000 GSN EMI upgrade kit and bulkhead replacement**
- **GSN switch with ports for optical to copper conversion and cabling**

or alternatively

- **SGI 2000 Package for Phantom TE GSN 1.9TB** - TE GSN SGI2000/O2
- **1-slot SGI-XT-GSN board with copper interface**

- **Data transfer rate** 210 MB/s to VRF/XFS t.b.d.

  Film speed ~16 f/s in 2048 x1556/3x10 bit/RGB filled to 32 bit

2.8.5 GSN DATA INPUT / SPECTER VIRTUAL DATACINE

Configuration

Specter Virtual DataCine and

GSN Input Specter VDC

- **1-slot SGI-XT-GSN board with copper interface**
- **SGI O2000 GSN EMI upgrade kit and bulkhead replacement**
- **GSN switch with ports for optical to copper conversion and cabling**

Data transfer rate 300 MB/s to VRF/XFS t.b.d.

Film speed ~23 f/s in 2048 x1556/3x10 bit/RGB filled to 32 bit

2.8.6 ROTATION

Range	-180° to +180° image rotation in STOP

2.8.7 HDTV

TV standards	1250/50	1125/60	1125/59.94 2:1 interlace 1920 x 1080 / 60 and 59.94 2:1 interlace
Display formats	full screen and horizontal / vertical letterbox		4:3 and 16:9
Fixed speeds	See corresponding SDTV speeds for 50 Hz standards 59.94 Hz standards for 1125 lines / 60 Hz	-> 625 lines / 50 Hz -> 525 lines / 59.94 Hz	30, 24, 18, 12, 6 fps
X-Y Zoom	Typical area magnification / HDTV		x 0.05 to x 9
Resolution	Not more than 3 dB down at 24 MHz in center & corner for FA 35mm, 2-, 3-, 4-, 6-perf and S16mm (Film losses not taken into account)		> 40%
Signal / Noise ratio	Measured with ND=1 in the vision gate, γ= 0.4:		> 50 dB for all channels

Digital Video Out

- CCIR Link A, B
- "4 : 2 : 2 YC_RC_B " or "4 x 4" YC_RC_BK / RGBK
- EDTV "8:8:8" (27 Mhz Sampling Rate)
- 10 or 8 bit per pixel selectable
- Parallel 2x d sub 50 pin, Pinning according to CCIR TG11
- Serial 2x2 BNC via included converters (1250/50Hz only in parallel mode available!)

Analog Video Out

- BNC
- R, G, B, S, K or Y, C_B, C_R, S, K
- Filtering according to EU95 - Nov. 1992

EXT REF

- BNC input for external trilevel sync

2.8.8 OPTION DTV (REQUIRES HDTV OPTION)

TV standards

- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive
- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive
- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1

Extern Reference

With analog trilevel sync according to SMPTE 296M (1280 x 720 P)
or
SEMPTE 274M (1920 x 1080) is possible

Monitoring

At post spatial processor test points only the first 921 pixels of a line are displayed.

Film speeds

• 60 Hz standards	30, 24, 18, 12, 6 fps
• 59.94 Hz standards	29.97, 22.98, 17.98, 11.99, 5.99 fps
• 24 Hz standards	24, 18, 12, 6 fps
• 23.98 Hz standards	23.98, 17.98, 11.99, 5.99 fps

2.8.9 OPTION VISTAVISION (REQUIRES OPTION ROTATION)

Film size format

- FA 35mm 8-perf (Vistavision)
  Resolution:
  horizontal scan lines 1500
  vertical scan pixels 1920
- FA 35mm 6-perf (Cinerama)

In 6-perf and 8-perf, ACA emulation and marker insertion are not supported.

Fixed speeds

• 50 Hz standards	25, 12.5, 6.25 fps
• 59.94 Hz standards	29.97, 17.98, 11.99, 5.99 fps
• 60 Hz standards	30, 18, 12, 6 fps

Select a speed 2.00 - 31.00 fps

2.8.10 STEADISCAN

Stabilization	Perforation-related correction, vertical and / or horizontally selectable	V + H
Film stock	35 mm - 4perf original camera negative film	35 mm NEG
Perforation holes	Reference holes selectable	N-type + P-type
Film speed range		2.00 to 6.25 f/s
Scanning system	CCD camera, 5m cable length between camera assembly and processing unit	
Light source	LED, light level adjustable	
Gate block	FA 35mm, illumination window cleaned by gate blast (external air supply required).	
Control I.F.	10 Base T Ethernet	iMCS
Mechanical Dimensions:		
Camera	Integrated into the film deck	
Processor	19 inch rack mount	4 RU
Supply Unit	19 inch rack mount	3 RU
Monitor	19 inch rack mount	7 RU
Keyboard	19 inch rack mount	2 RU
Mains supply	One phase current,	190 to 264 V AC or 90 to 130 V AC
Power consumption	Typically	300 VA

2.8.11 6-SECTOR COLOR PROCESSOR

System	Secondary Color Processing The design and implementation is 100% digital integrating perfectly within the high speed digital signal processing architecture of the DataCine. It employs up to 16 bit quantization and operates in real time at up to 2K resolutions.	
Color Qualification	• 6 Sectors (Hue) (selection of the color that is to be modified)	Red, Yellow, Green, Cyan, Blue, Magenta;
Sector adjustment (Hue)	• 6 x Position	-30^0... 0 ...$+30^0$
	• 6 x Width	180^0 ...60^0 ...15^0
Color Modification	Correction of the selected sector	
	• Luminance	0 ..100% .. 200%
	• Saturation	0 ..100% ...200%
	• Hue	-180^0 ..0 ..$+180^0$
Master Correction	• Master Saturation	0 ..100% ...200%
	(all other Master Corrections as such as lift, gain and gamma are functions of the Primary Color Processor of the basic Spirit DataCine)	
Limiter & Legalizer	• Limiter in Luminance Soft or hard clipping switchable	
	Clip levels adjustable	100%, 102%, 108%
	• Legalizer in Chrominance Saturation remains within selected legal limits: R G B	100%, 102%, 108%
Control	Functional Control Panel: All 6 SC Processor controls are provided	
Operator Control	Via external Controllers / Programmers / Color Correction Systems e.g. from Pandora, DaVinci ...	
Control Interface	Via serial iMCS bus	

2.8.12 S8MM FILM SCANNING

Sprocket Wheel	• Combined sprocket wheel for S8mm, 16mm and 35mm films	
Film Gate	• Super 8mm adapter for the 16mm Lens Gate Assembly	
Winding Plates	• Fixed winding plates with adapters for 8mm reels (min. core diameter = 50mm, standard run up characteristic starting at a core diameter of 75mm)	
Camera aperture	• Format preset type S8 5.79mm x 4.22mm Center = 4.32mm	
Select A Speed	• 4 f/s ... 57 f/s	
Variable visible search speed range	• 4 f/s ...240 f/s	
Optical resolution	• Equal to Super 16mm	measured in LP/mm
Framing Adjustment	• -60% ... +60% of total frame height	
Restrictions	• S8 mm **Audio** scanning not supported	

3. SYSTEM APPLICATIONS

The Spirit DataCine Film Scanner SDC 2002 may be connected to a great variety of video, audio, data processing and controller equipment.

It can be equipped with all necessary digital and analog outputs.

This chapter will give the user some examples of typical film scanner applications.

The film scanner configurations are made in the main menus of the GCP1 Graphical Control Panel.

Trademarks **All brand and product names are trademarks of their respective companies. Technical information in this document is subject to change without notice.**

3.1. SDC 2002 SDTV Film to Tape Application / Pandora "Pogle" and Noise Reducer VS 4

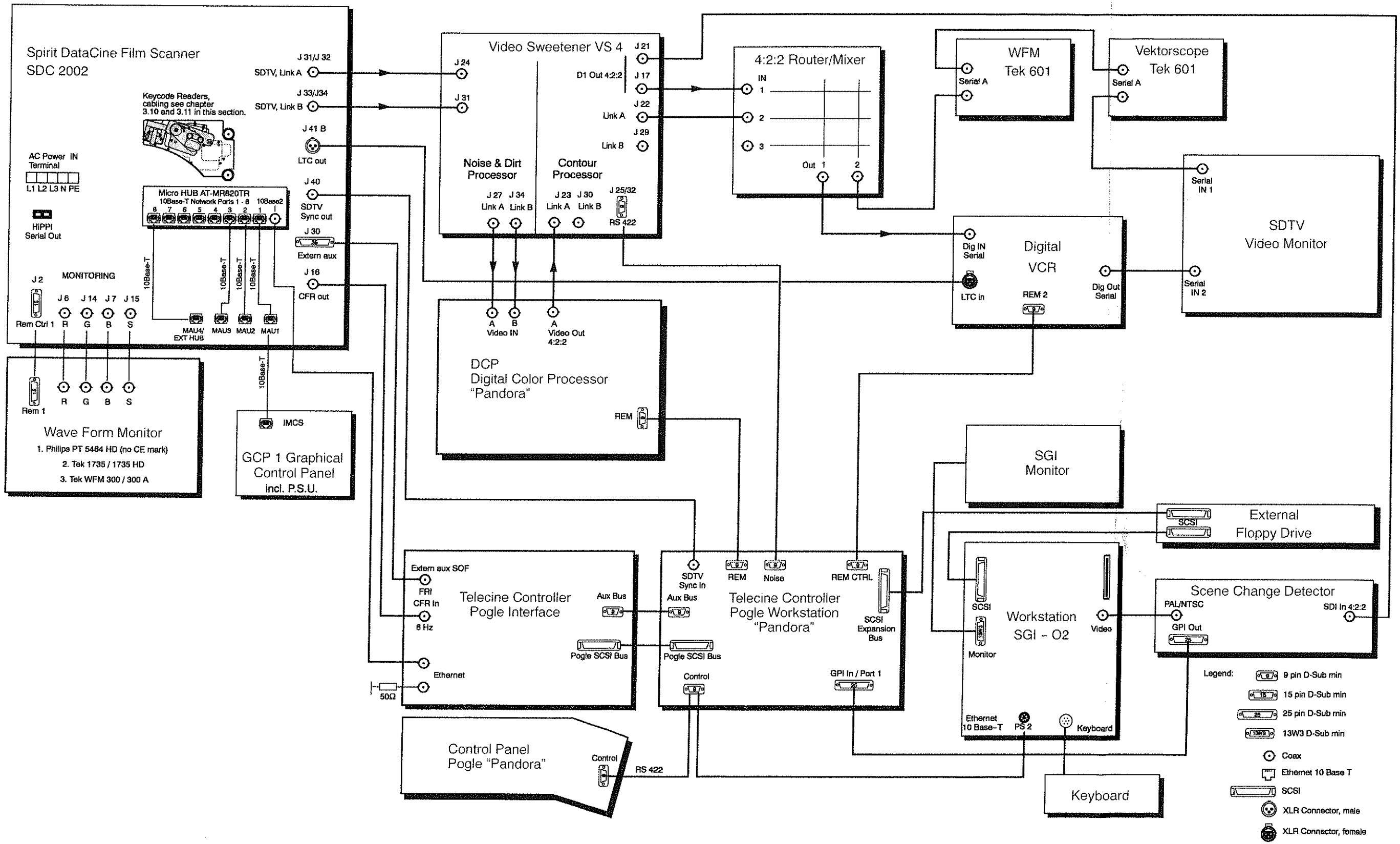


Fig. 300: Spirit DataCine Film Scanner with telecine controller Pandora Pogle and Noise Reducer VS 4

3.2. SDC 2002 SDTV Film to Tape & Data Application / Pandora "Pogle", Grain Reducer SCREAM and Phantom Transfer Engine

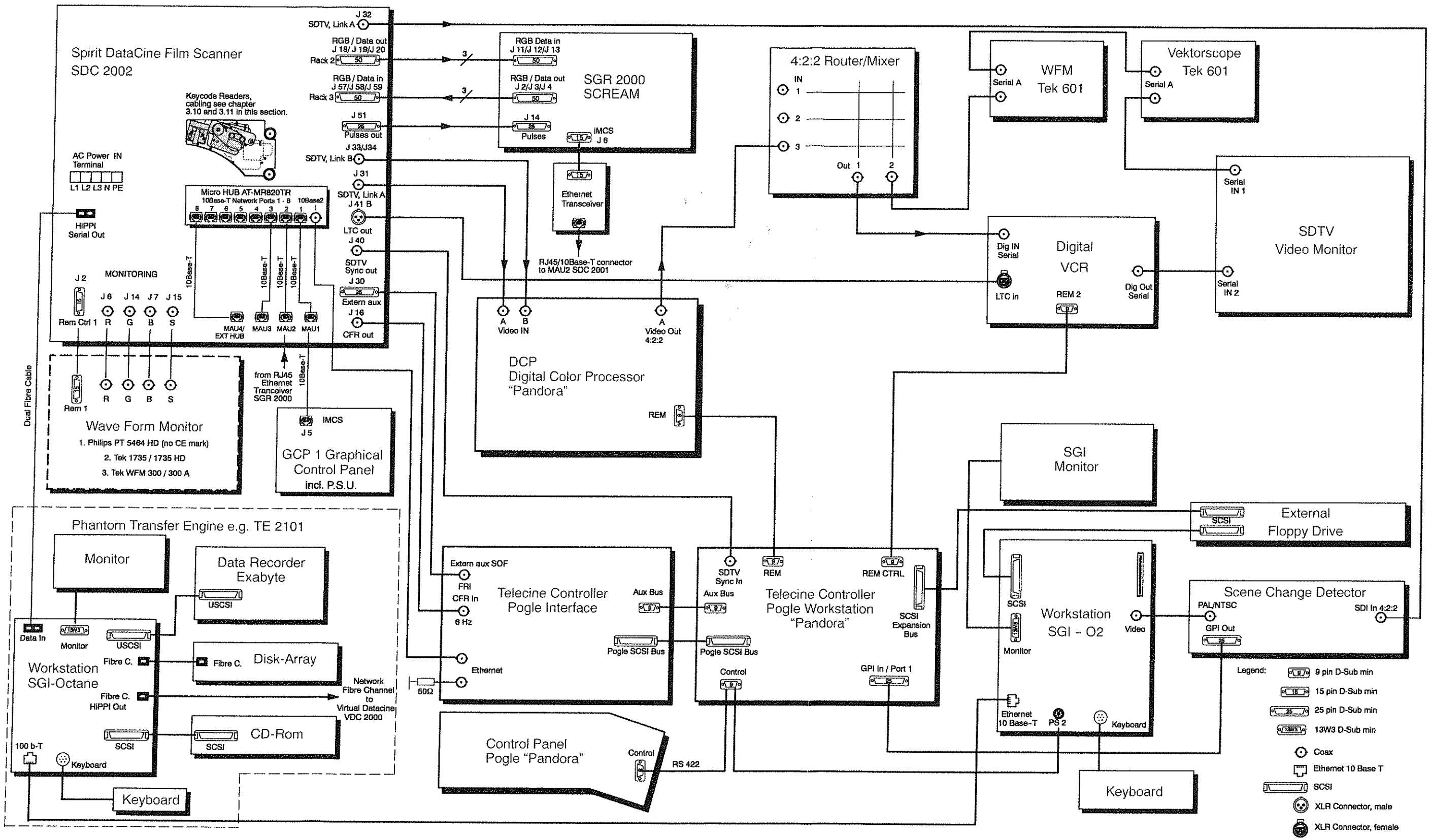


Fig. 300: Spirit DataCine Film Scanner with telecine controller Pandora Pogle, SGR 2000 and Phantom Transfer Engine

3.3. SDC 2002 (with Steadiscan) SDTV Film to Tape Application / Telecine Controller Pandora "Pogle" and Noise Reducer VS 4

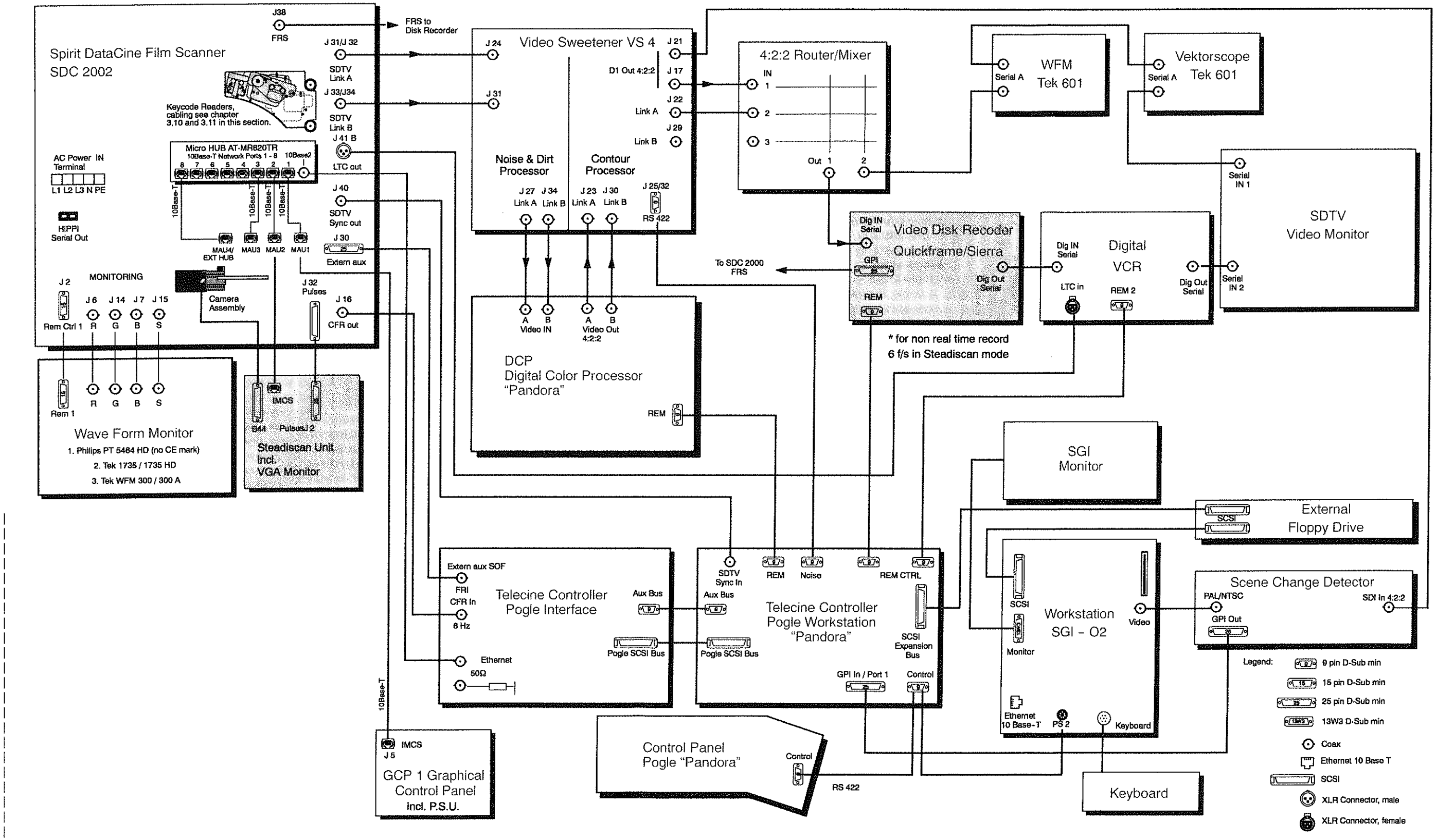


Fig. 300: SDC 2002 incl. Steadiscan, telecine controller Pandora Pogleand and VS 4

3.4. SDC 2002 (with Steadiscan) SDTV Film to Tape & Data Application / Pandora "Pogle" Grain Reducer SCREAM and Phantom Transfer Engine

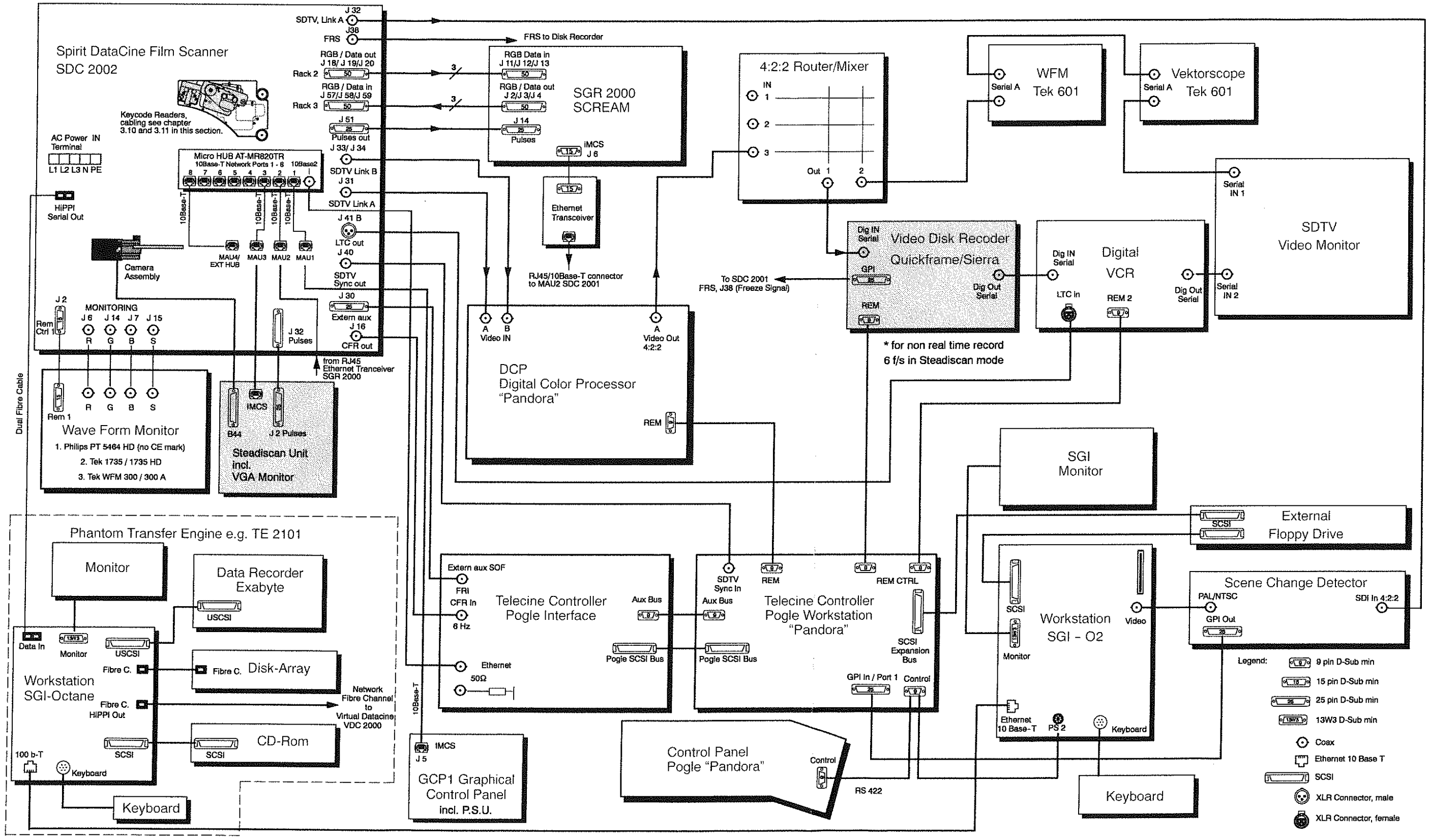


Fig. 300: SDC 2000 incl. Steadiscan, telecine controller Pandora Pogle, SGR 2000 and Phantom Transfer Engine

3.5. SDC 2002 SDTV Film to Tape Application / DaVinci "Renaissance" and Noise Reducer VS 4

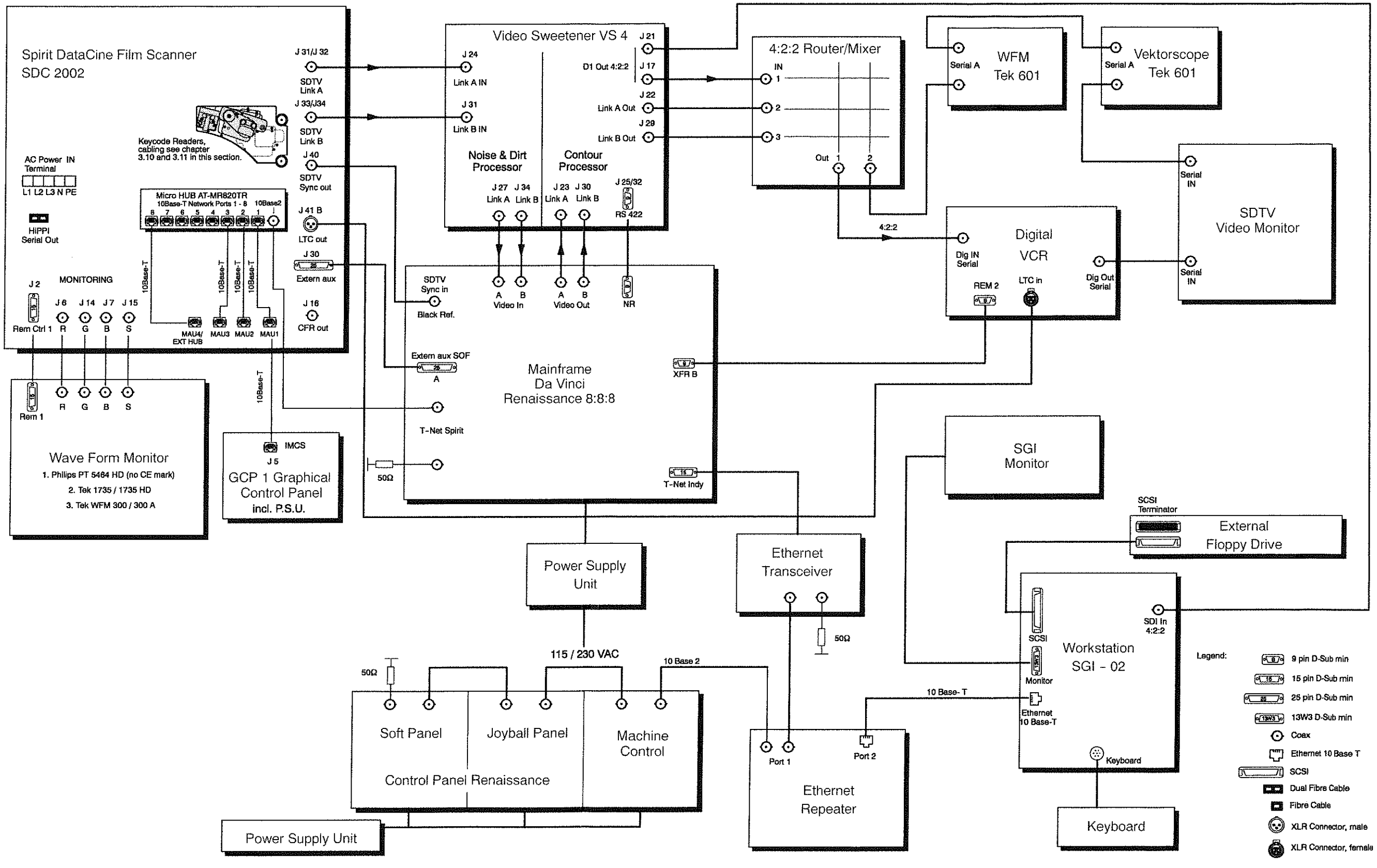


Fig. 301: Spirit DataCine Film Scanner with telecine controller Da Vinci "Renaissance" and VS 4

3.6. SDC 2002 SDTV Film to Tape & Data Application / DaVinci "Renaissance", Grain Reducer SCREAM and Phantom Transfer Engine

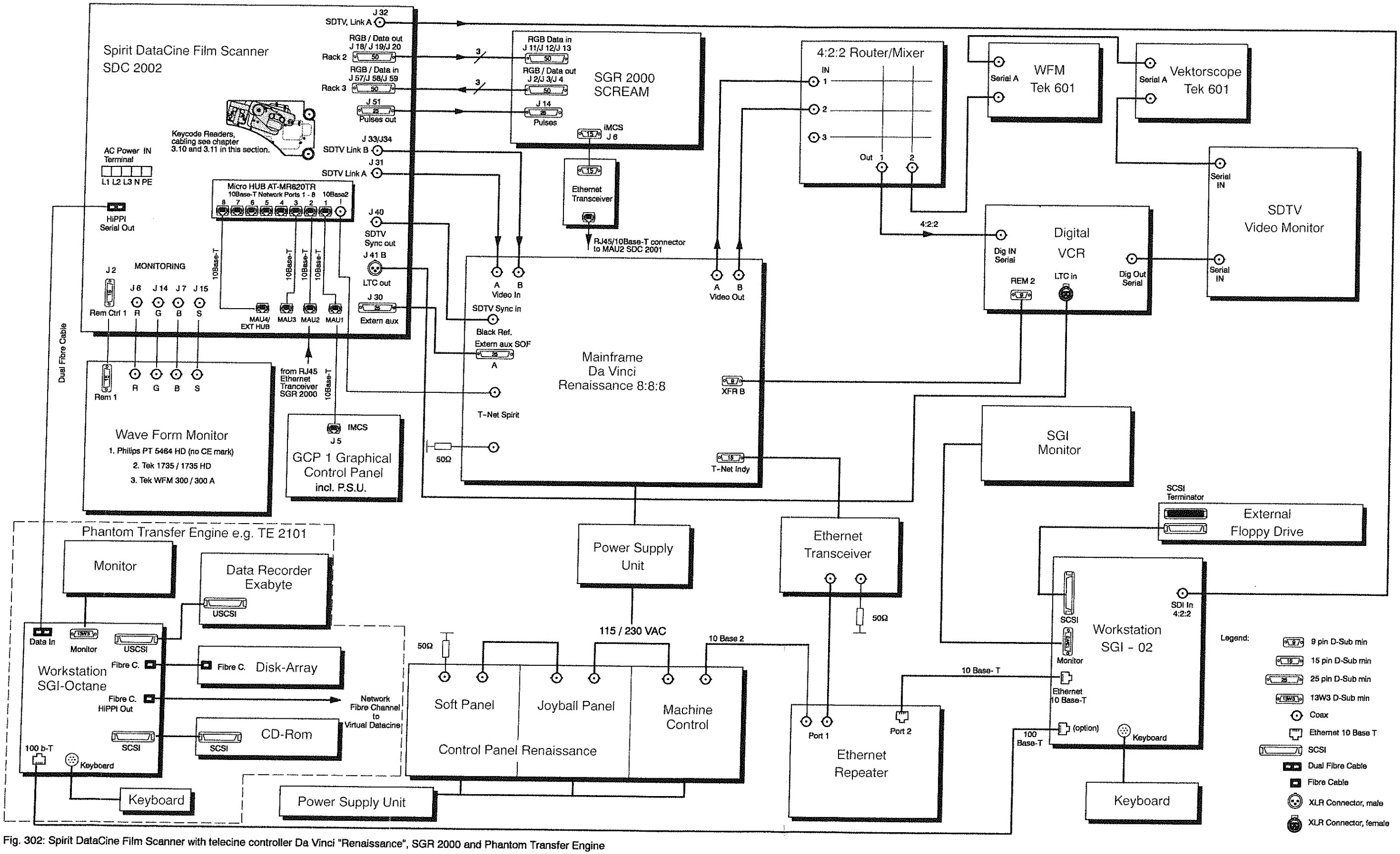


Fig. 302: Spirit DataCine Film Scanner with telecine controller Da Vinci "Renaissance", SGR 2000 and Phantom Transfer Engine

3.7. SDC 2002 SDTV Film to Tape and Data Application / Pandora "Pogle", MegaDef, Grain Reducer SCREAM and Phantom Transfer Engine

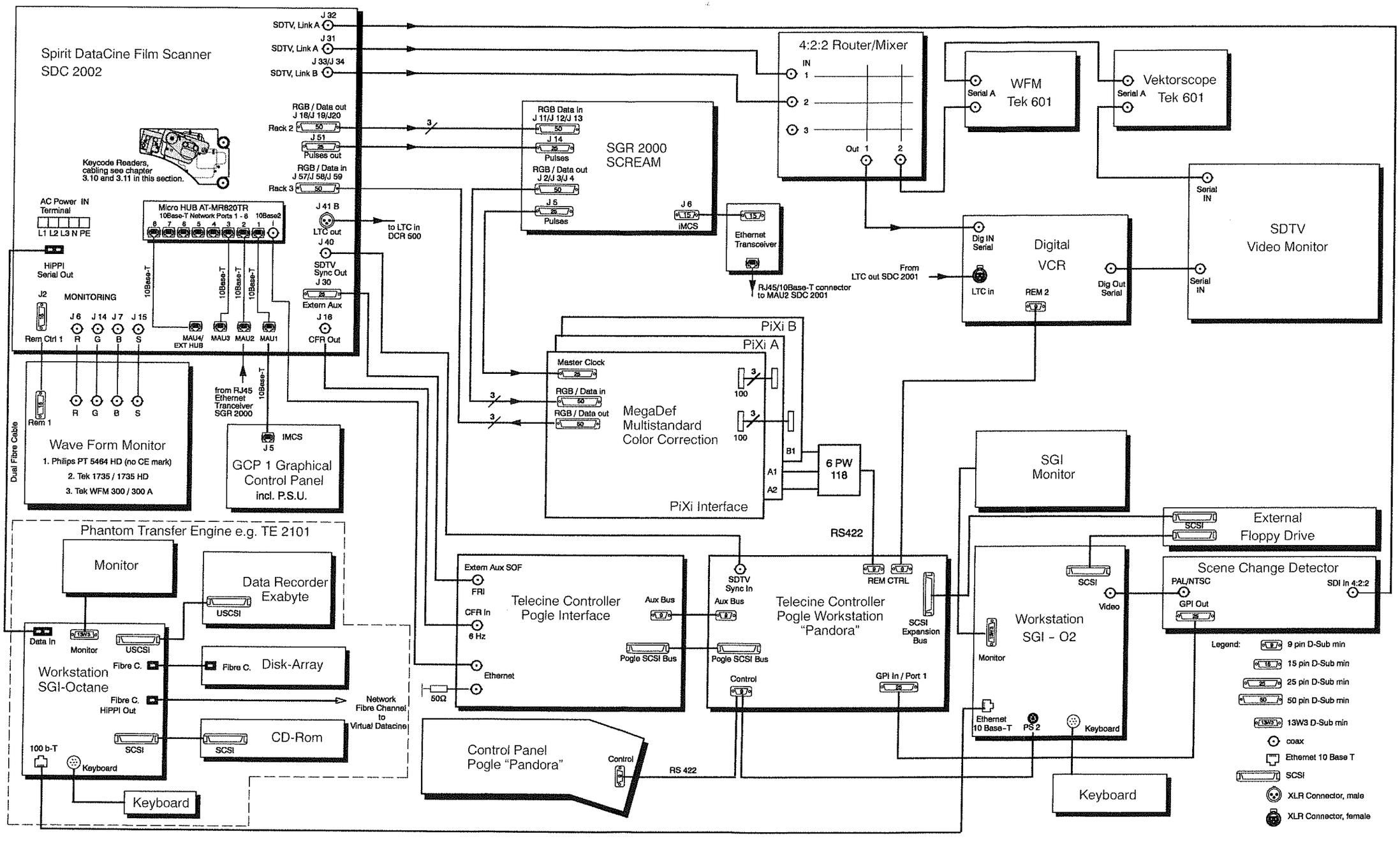


Fig. 303: Spirit DataCine Film Scanner with telecine controller Pandora "Pogle", MegaDef, SGR 2000 and Phantom Transfer Engine

3.8. SDC 2002 (with Steadiscan) SDTV Film to Tape Application / DaVinci "2K" and Noise Reducer VS 4

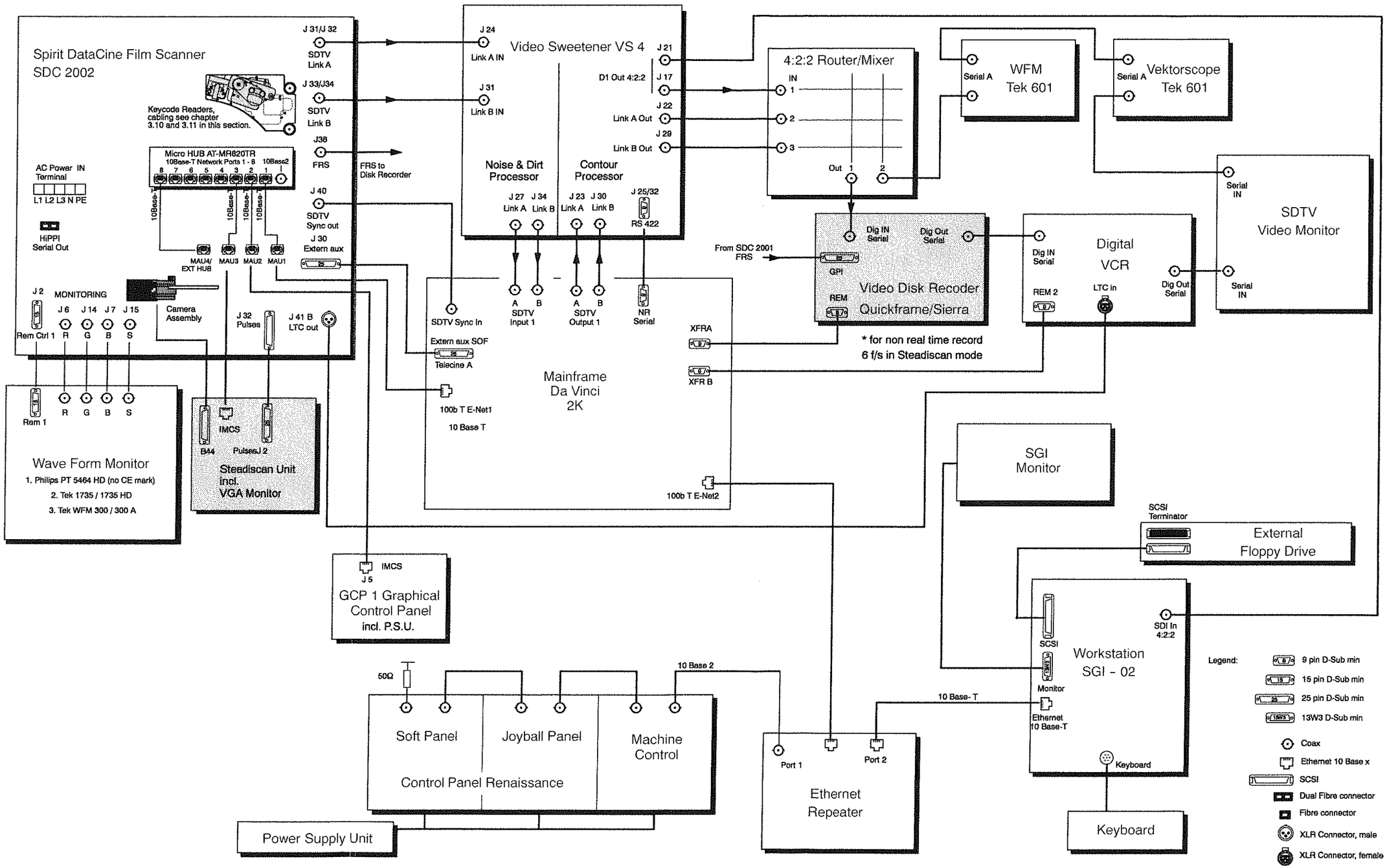


Fig. 304: Spirit DataCine incl. Steadiscan with telecine controller Da Vinci "2K" and Noise Reducer VS 4

3.9. SDC 2002 (with Steadiscan) SDTV Film to Tape & Data Application / DaVinci "2K", Grain Reducer SCREAM and Phantom Transfer Engine

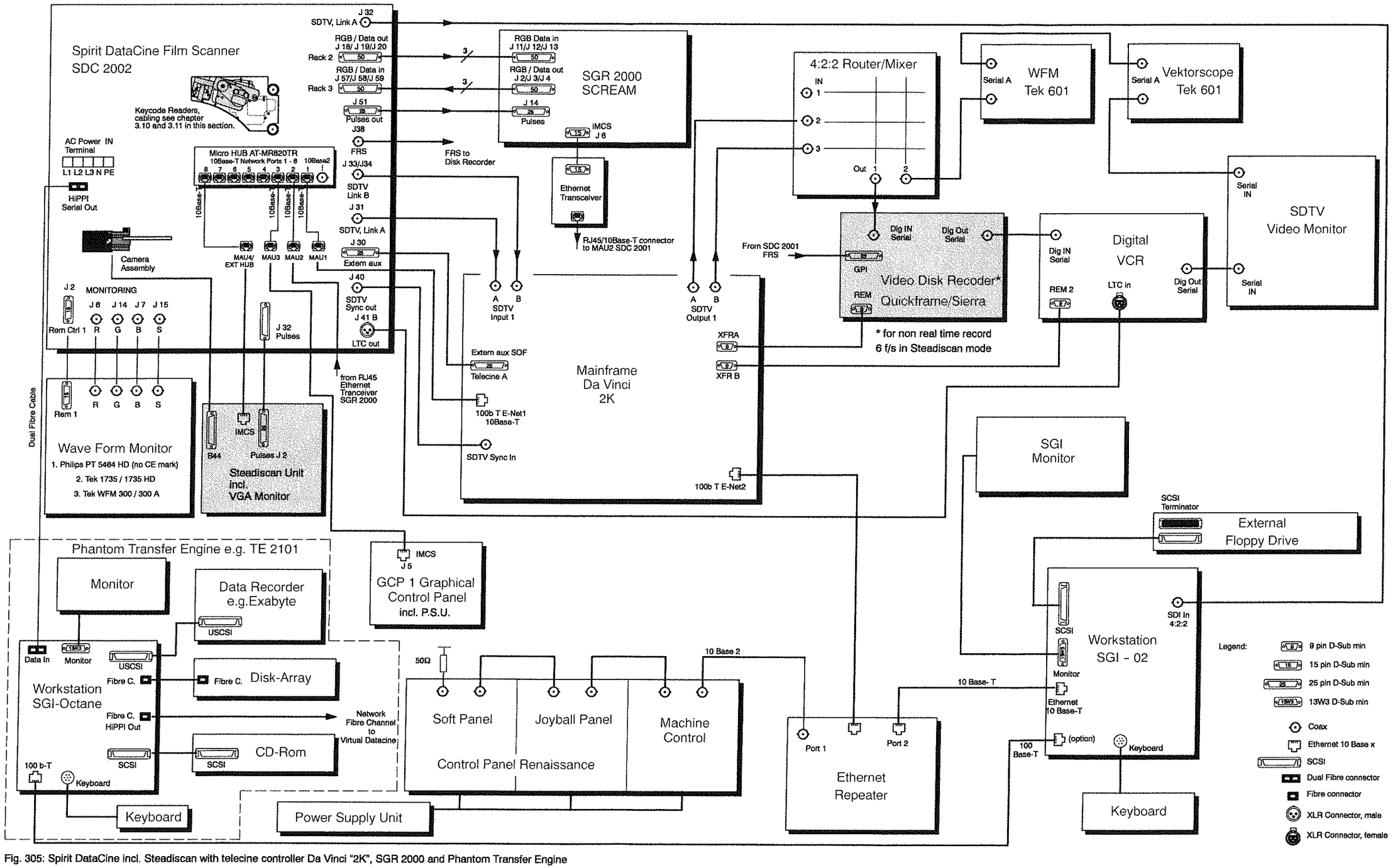


Fig. 305: Spirit DataCine incl. Steadiscan with telecine controller Da Vinci "2K", SGR 2000 and Phantom Transfer Engine

3.10. SDC 2002 HDTV Film to Tape & Data Application / DaVinci "2K", Grain Reducer SCREAM and Phantom Transfer Engine

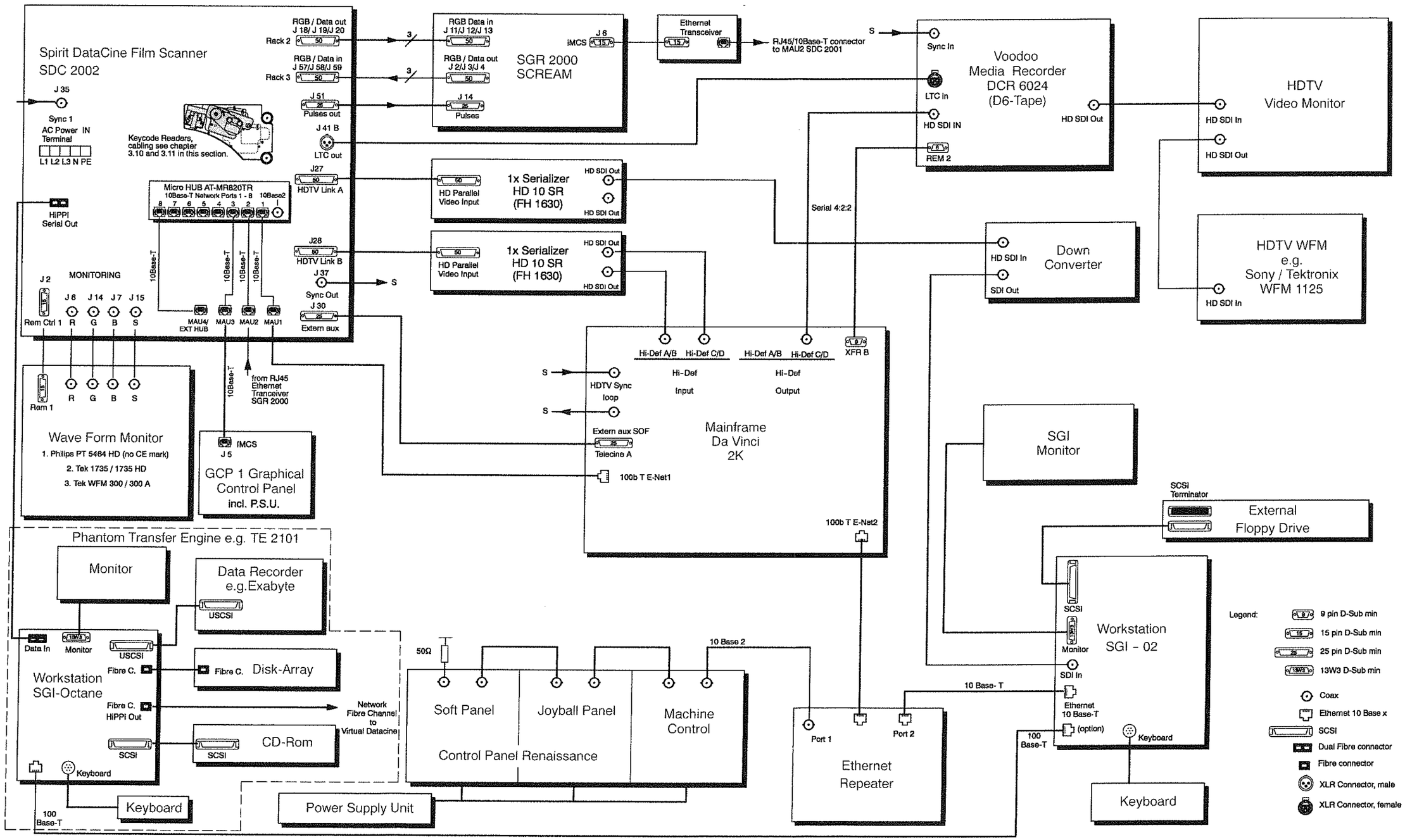


Fig. 306: Spirit DataCine Film Scanner with telecine controller Da Vinci "2K", SGR 2000 and Phantom Transfer Engine

3.11. SDC 2002 Multistandard HDTV Film to Tape Application / Pandora "Pogle", MegaDef Color Correction and SCREAM Grain Reducer

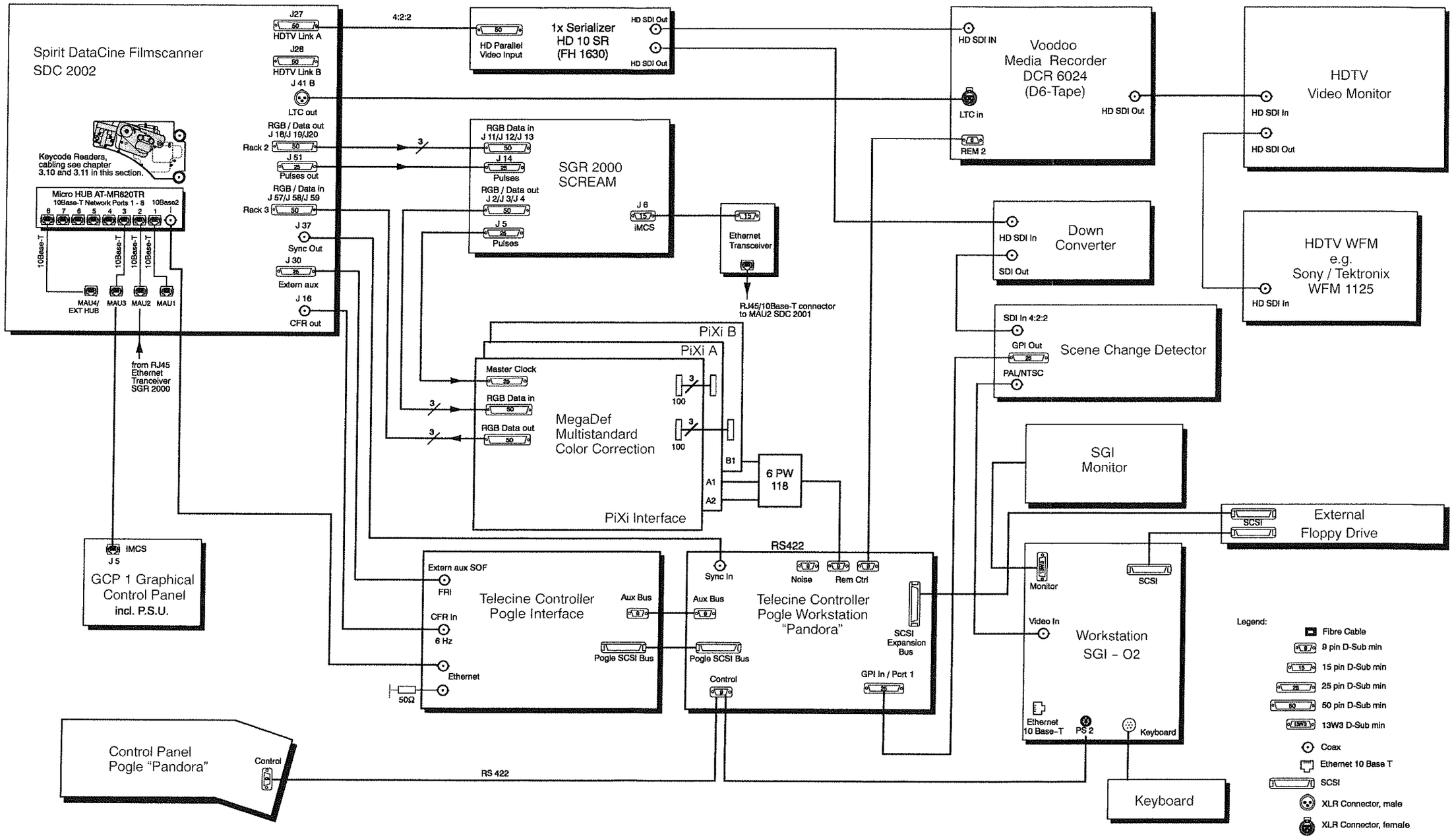


Fig. 307: Spirit DataCine Film Scanner with telecine controller Pandora "Pogle", MegaDef and SGR 2000

3.12. APPLICATION SPIRIT DATACINE, PHANTOM TRANSFER ENGINE TE 2111, NOISE RED. SGR2000, TELECINE CONTROLLER DA VINCI 2K & SPECTER PLAYOUT ENGINE

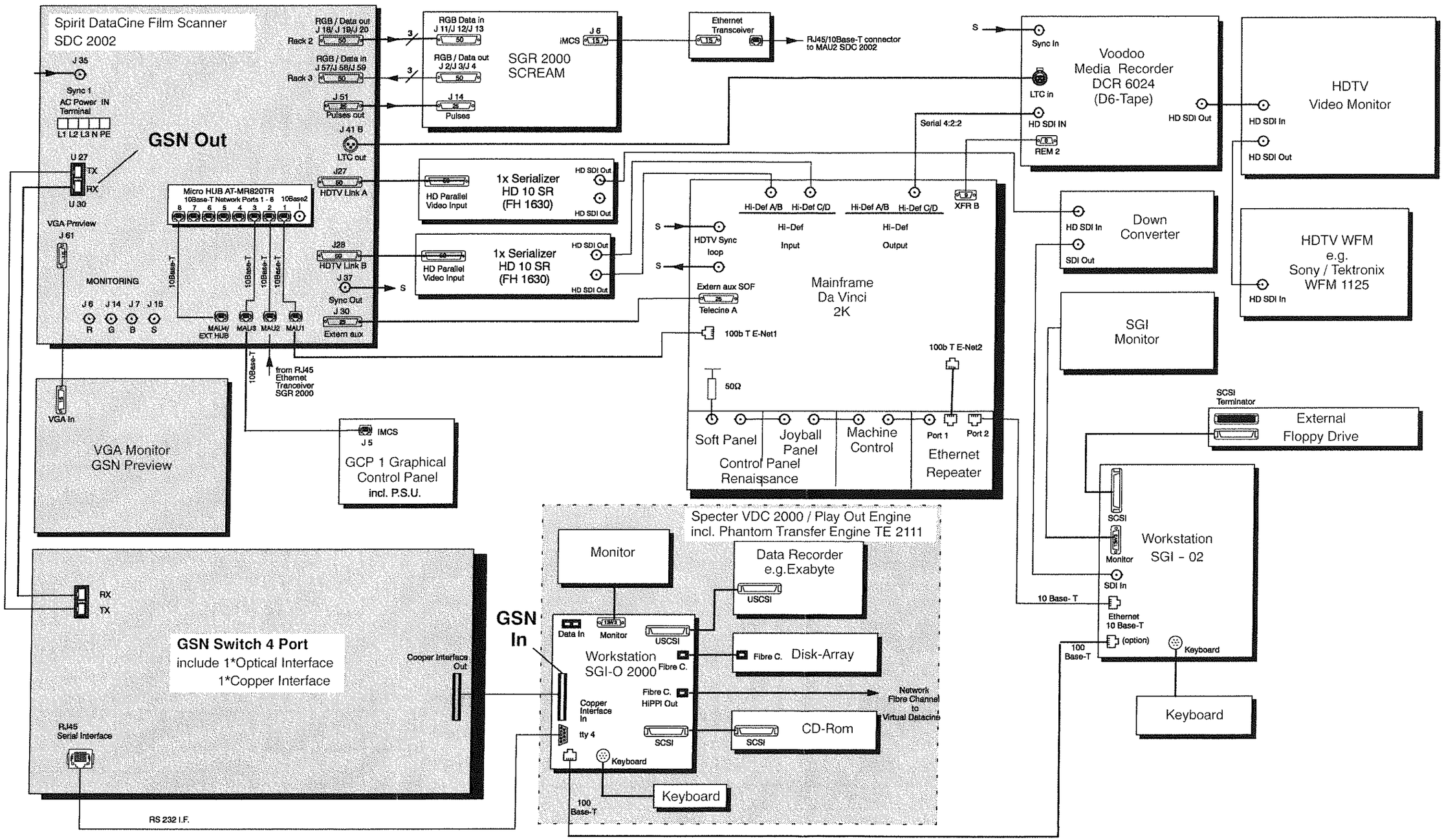


Fig. 308: Spirit DataCine Film Scanner with telecine controller Da Vinci "2K", Noise Reducer SGR 2000 and Phantom Transfer Engine TE2111

3.13. Waveform Monitoring (maximum configuration)

1. Interface cable "Remote Control" from SDC 2001 to WFM TEK 1740-1760

SDC 2001 Rack 2 15-pin subminiature D-connector male		TEK 1740-1760 25-pin subminiature D-connector male
pin 5	Recall 2 Superimposed	pin 18
pin 6	Recall 3 Vector	pin 19
pin 7	Recall 1 Parade	pin 17
pin 9	GND	pin 14

2. Interface cable "Remote Control" from SDC 2001 to WFM Philips PM 5664
Disconnect pin 1 and 2 on each side from the control cable PM5664, otherwise the remote control functions are disturbed.

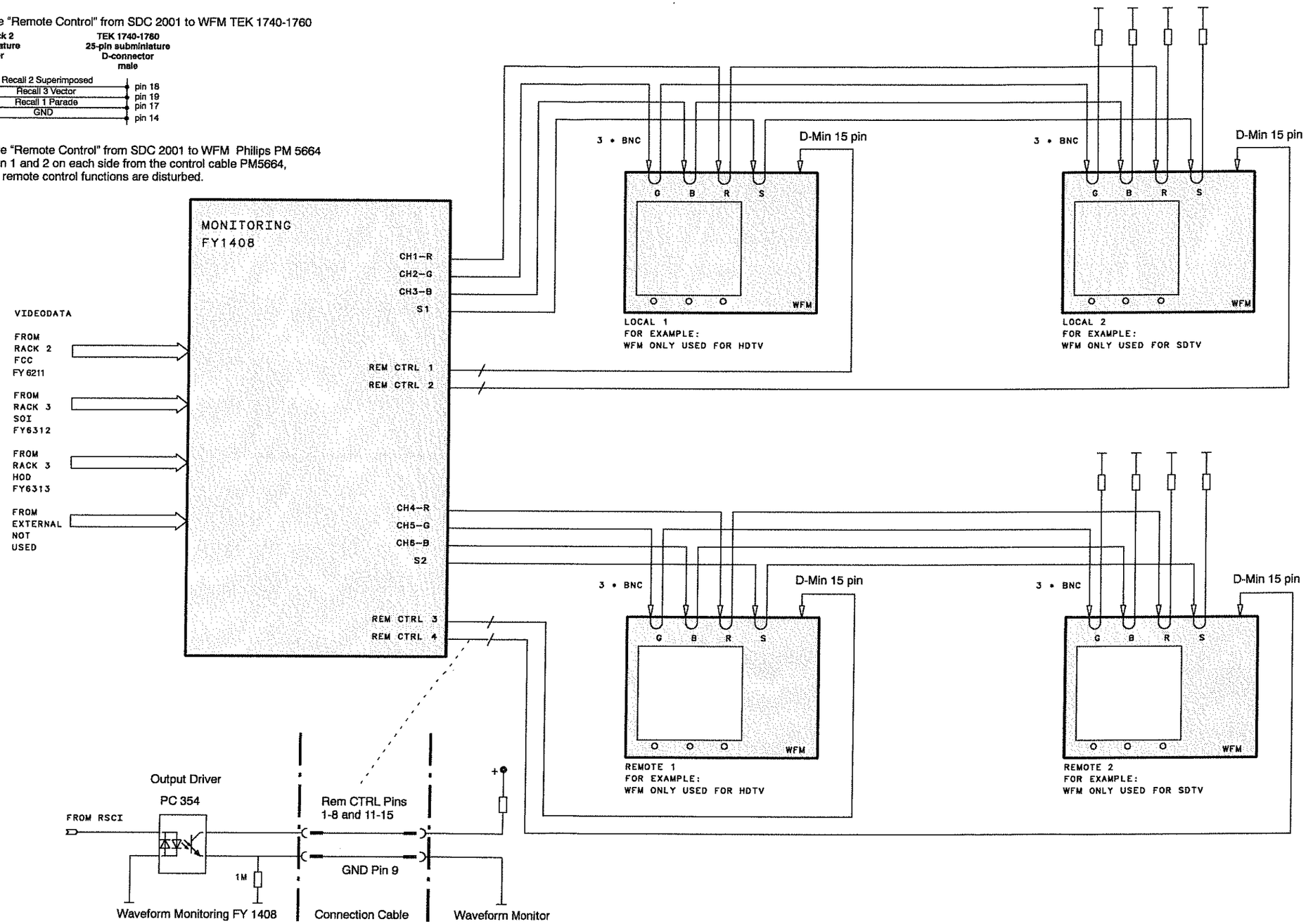
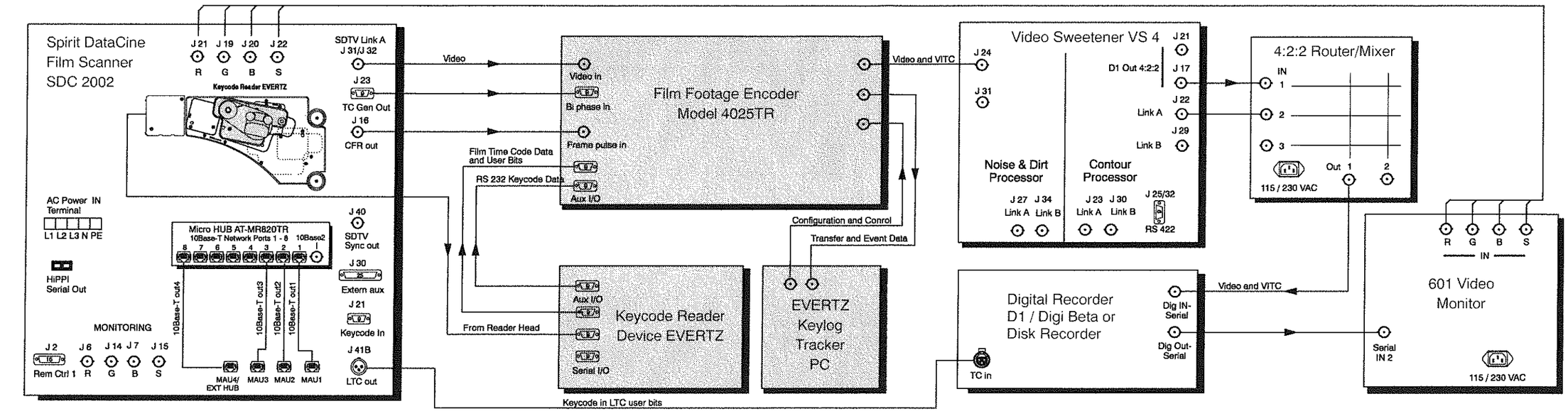


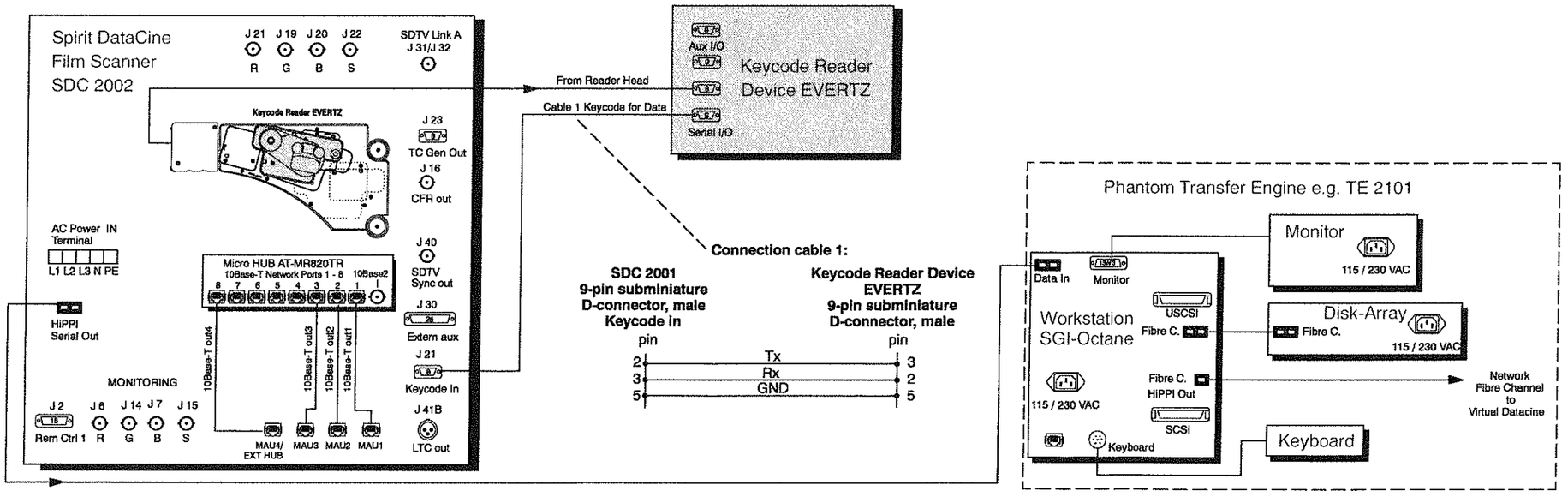
Fig. 309: Waveform Monitoring

3.14. Keycode Applications EVERTZ

3.14.1. Keycode in SDTV, LTC-Out and VITC

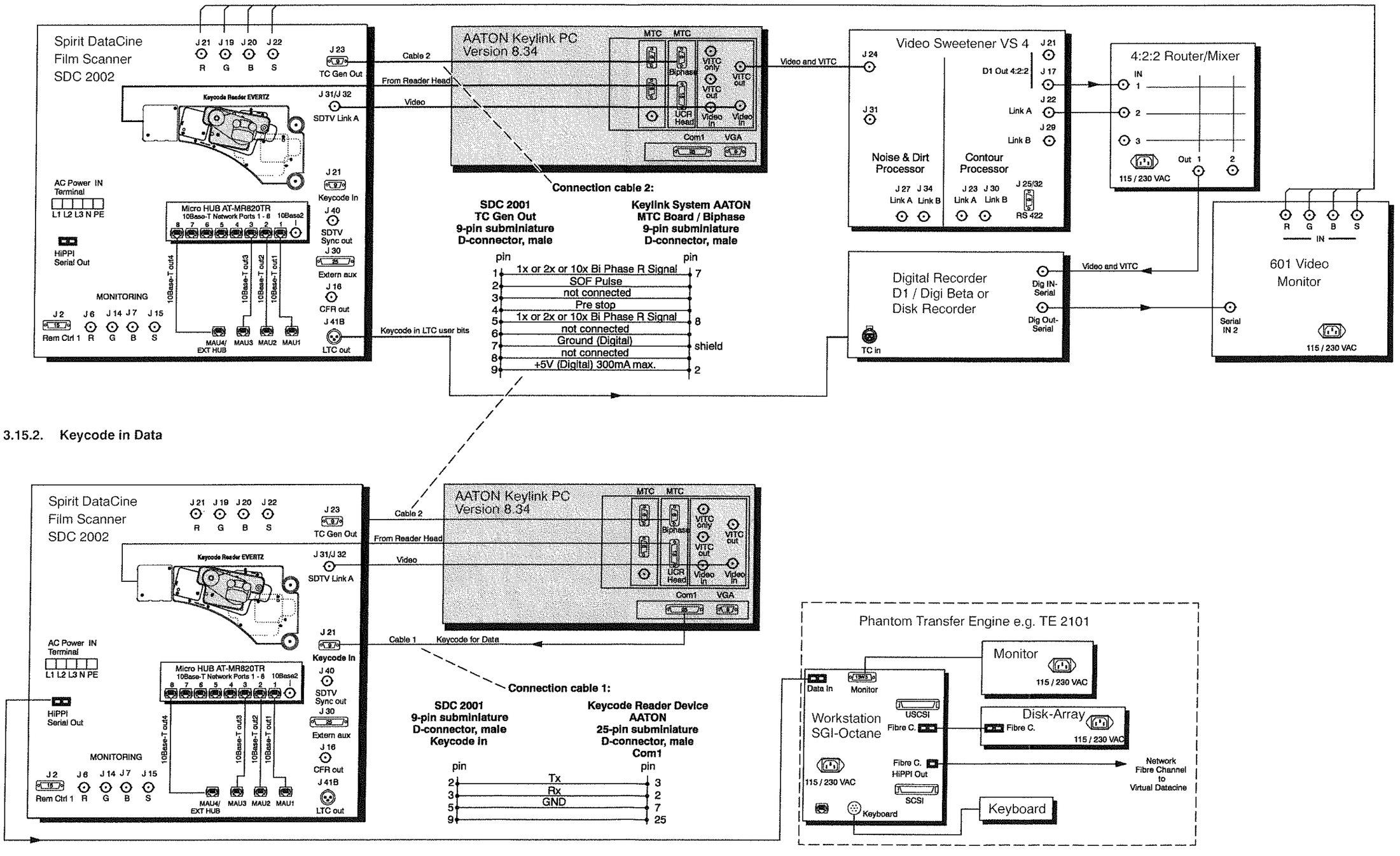


3.14.2. Keycode in Data



3.15. Keycode Applications AATON

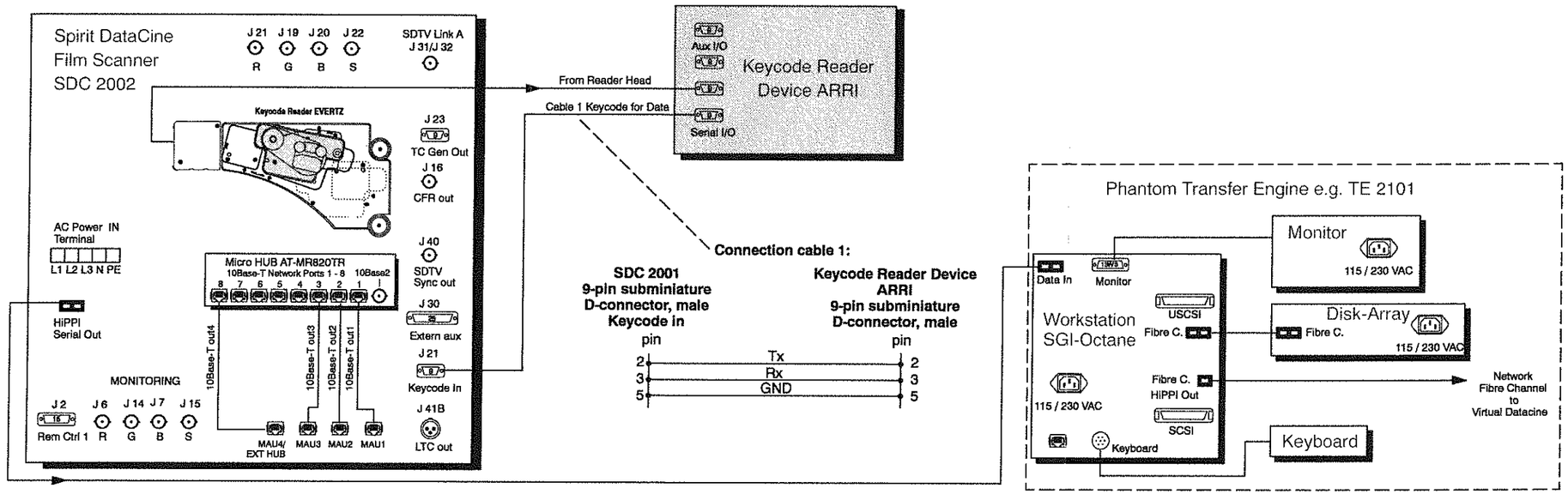
3.15.1. Keycode in SDTV, LTC-Out and VITC



3.15.2. Keycode in Data

3.16. Keycode Applications ARRI

3.16.1. Keycode in Data



4. INSTALLATION

Warnings

The film scanner unit weights approx. **1314 lbs / 595 kg!**

Attention:
The film scanner unit has to be unpacked and lifted up by authorized forwarding agencies only, with appropriate lifting tool under control and instruction of Thomson service personnel!

Danger of injury when the film scanner is being lifted to the upright position!

Mains installation **must** only be done by qualified personnel!

Power supply in excess of 40 volts are potentially hazards or lethal.

Supplies of up to 25 kV (Ignition Xenon Lamp) exist within the film scanner.

At no time should contact be made with the machine wiring or terminals, except via a probe with appropriate insulating properties.

The film scanner is designed to be operated with locked front and rear doors.

The rear doors must only be removed by qualified service personnel for maintenance purposes.

The film scanner cannot operate with open filmdeck doors. An interlock switch is fitted for safety purposes.

Do not modify the operation of this switch.

Ultraviolet Radiation

Caution!
High-intensity ultraviolet energy exists within the illumination path, generated by the Xenon arc projection lamp. Protect eyes and skin.

4.1 UNPACKING THE FILM SCANNER

The film scanner unit weights approx. **1314 lbs / 595 Kg!**

Attention:
The film scanner unit has to be unpacked and lifted up by authorized forwarding agencies only, with appropriate lifting tool under control and instruction of Thomson service personnel!

Danger of injury when lifting the film scanner to the upright position!

The film scanner unit lies on its back in the transport crate. The accessories are contained in a separate transport case.

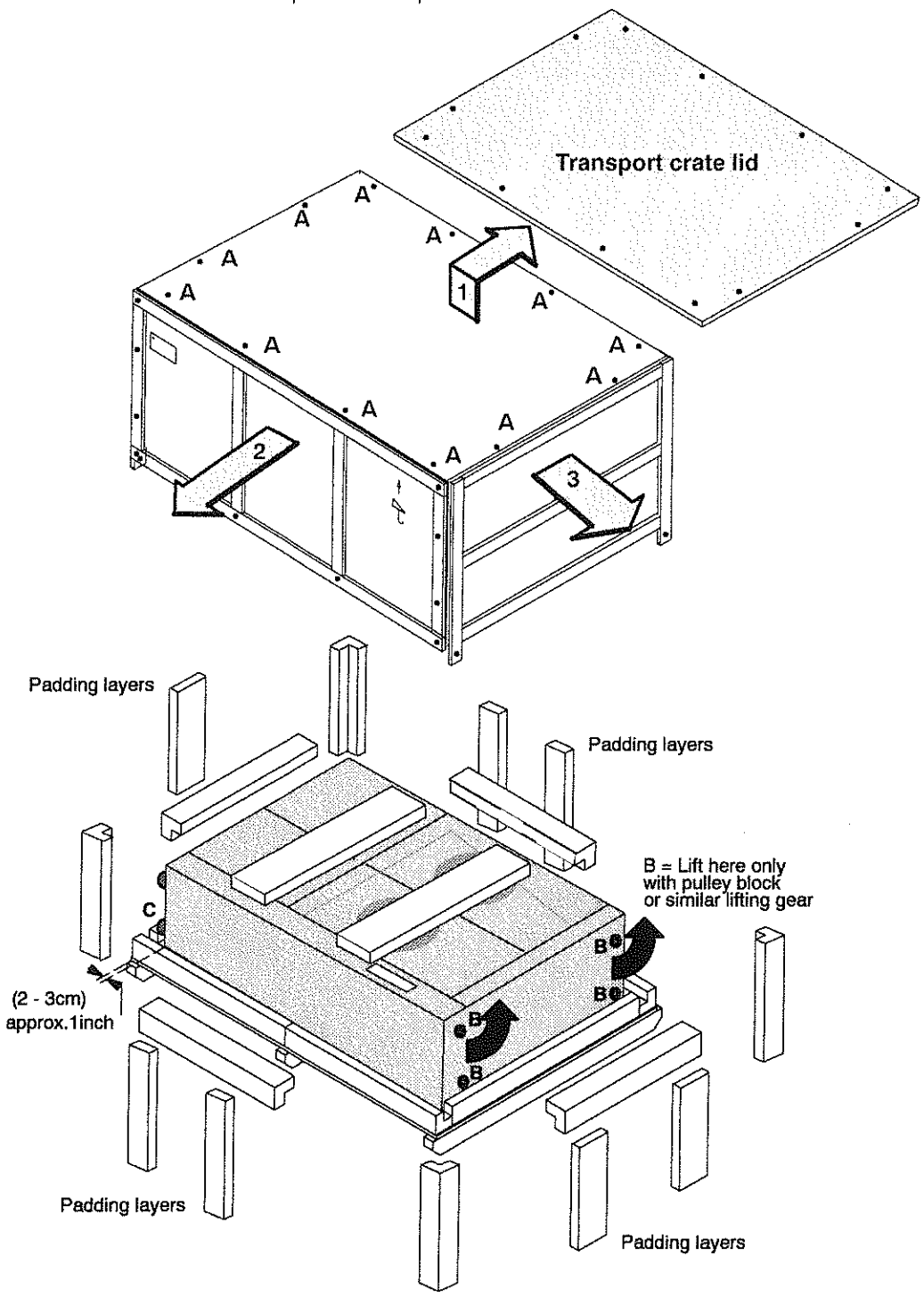


Fig. 400: Transport crate of SDC 2002

INSTRUCTIONS FOR AUTHORIZED FORWARDING AGENCIES ONLY!

Unpacking

- For unpacking, first remove the straps around the transport crate.
- Open the upper fixing screws (fig. 400/**A**) of the transport crate lid.
- Lift up and remove the transport crate lid (fig. 400/**1**).
- Remove padding layers.
- Open the fixing screws of the side walls (fig. 400/**2, 3**) and remove them.
- Cut open the cover foil at the three lower sides and remove it.
- Now the film scanner is prepared to be set upright.

Setting upright

The unit can be set upright only with appropriate lifting tool under control and instruction of Thomson service personnel!

The unit has a net weight of approx. **1314 lbs** or **595 kg** and is supported on 4 bottom rollers for moving to its final location.

- Push the cabinet with its bottom approx. **1 - 1.2 inch** or **2 - 3 cm** close to the edge of the transport crate (fig. 400).
- Turn the two lower bottom rollers upwards for protection (fig. 400/**C**).
- Fix two (or four) hooks of the lifting tool onto the two lower (or onto all four) loops of the cabinet (fig. 400/**B**).
- Lift up the cabinet slowly while two persons support it from both sides until the two upper bottom rollers are standing on the floor.
- Continue lifting up until the bottom plate of the transport crate can be pulled out. Take care that the cabinet cannot roll away.
- Put down the cabinet slowly until the two lower bottom rollers are also standing on the floor.

Ground load

The floor space amounts 12.1 sq. ft. or 1.12 m^2 and results in a **ground load of 109 lbs / sq. ft.** or **531 kp / m^2**.

Setting up

The bottom rollers enable the film scanner to be moved to its final location.

Caution!
Do not move the film scanner over coarse floor unevenness otherwise the bottom rollers could be broken.

Peak area load

Four threaded leveling feet are located in the corners of the bottom frame for final stationing.
The feet have a diameter of 40 mm ∅ = 12.5 cm^2. This results in a **peak area load of < 227 lbs / sq. inch** or **< 16 kp / cm^2**.

Take care that the location is such that the ground loading is not exceeded.

ATTENTION!

Adjust film scanner in horizontal position with the threaded leveling feet.

These feet have to be unscrewed with an open wrench, size 17 mm to compensate the floor unevenness.

For transport, the feet were completely screwed in.

Installation **Mount film scanner on concrete or other non-combustible surface only.**

Keep packaging Please keep the packaging. The film scanner **must only** be transported in this original packaging.

4.1.1 ACCESSORIES

The accessories are supplied separately in stable cardboard packages.

Check that all parts are delivered.

- **GCP Graphical Control Panel**
- **Lens Gate Assembly (16 mm or 35 mm)**
- **Effect Filter Kit**
- **Customer's Manual**
- **FH 1020 Basic Accessories**
- **Set of condenser lenses, filters and projection lamp**
  Condenser lenses 1 & 2, infrared filter, heat absorbing filter, 4 dichroic filters for the filter wheel and the projection lamp (Xenon lamp).
- **Options if requested**

4.2 SPACE REQUIREMENTS AND ENVIRONMENTAL CONDITIONS

Mechanical dimensions

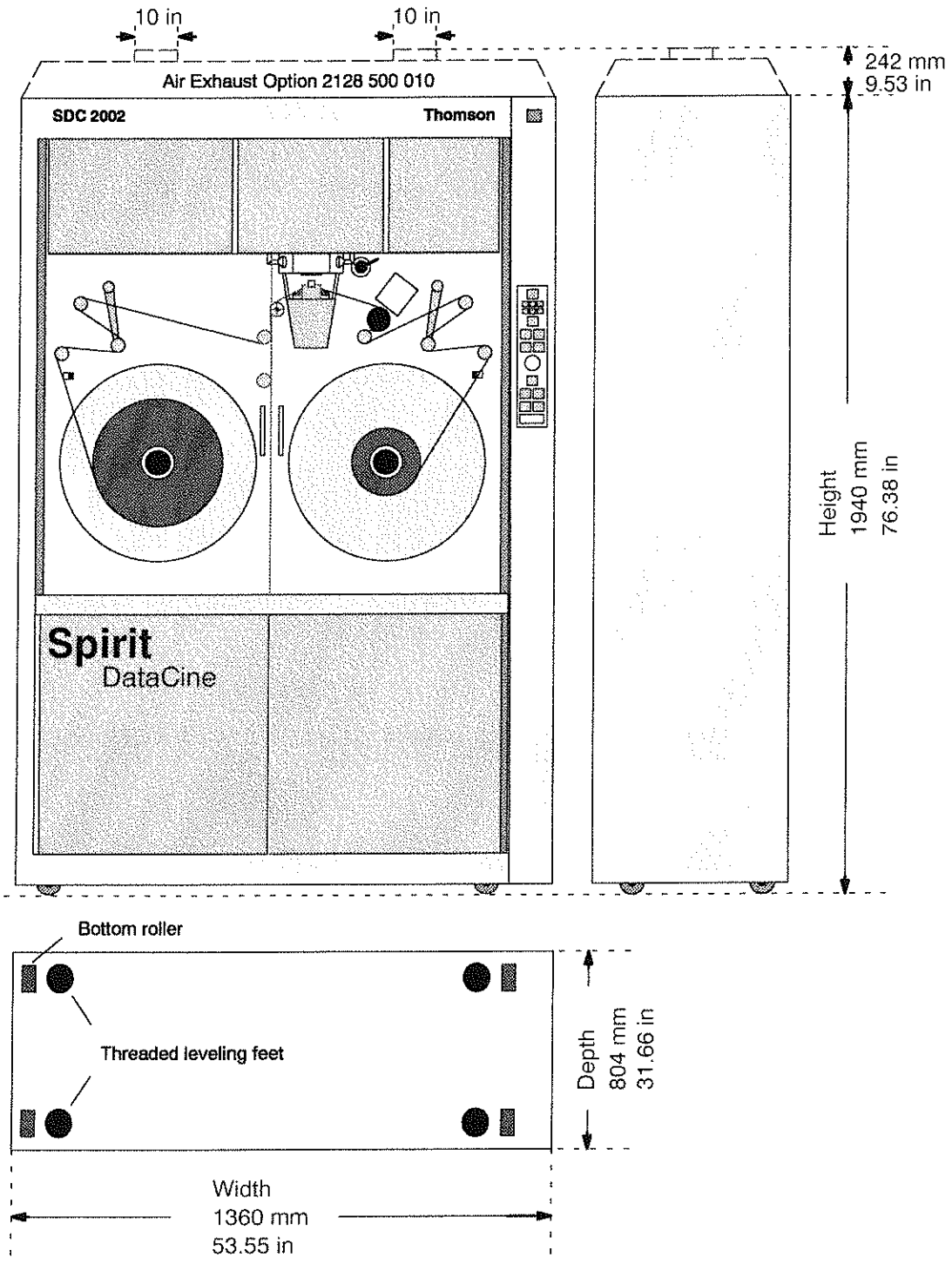


Fig. 401: Mechanical dimensions of the SDC 2001 cabinet

Location

Space

The equipment has to be accessible both from the front and the rear side.

When installing the film scanner, care should be taken not to cover the fresh air entries, see figure 402.

Ensure that the area is dustfree and the dust cannot enter through ventilation filters.

Operation temperature

The ambient temperature during operation must not exceed or fall below the range of +10° C to +35° C.

Air condition is required if the temperature exceeds 40° C or if relative humidity is higher than 80%.

Optimum operation is at a temperature of +20° C to +30° C.

Ventilation

Air stream

The ventilation air stream enters through openings in the bottom frame.

Four bottom frame mats and one AIH air filter mat protect against dust.

The outgoing air leaves the cabinet from bottom to top. It is either led into the room or through openings on top of the cabinet to an air outlet system.

The required air throughput is 900 m^3/h (1200 cu. yd. / h) for 20° C ambient air temperature.

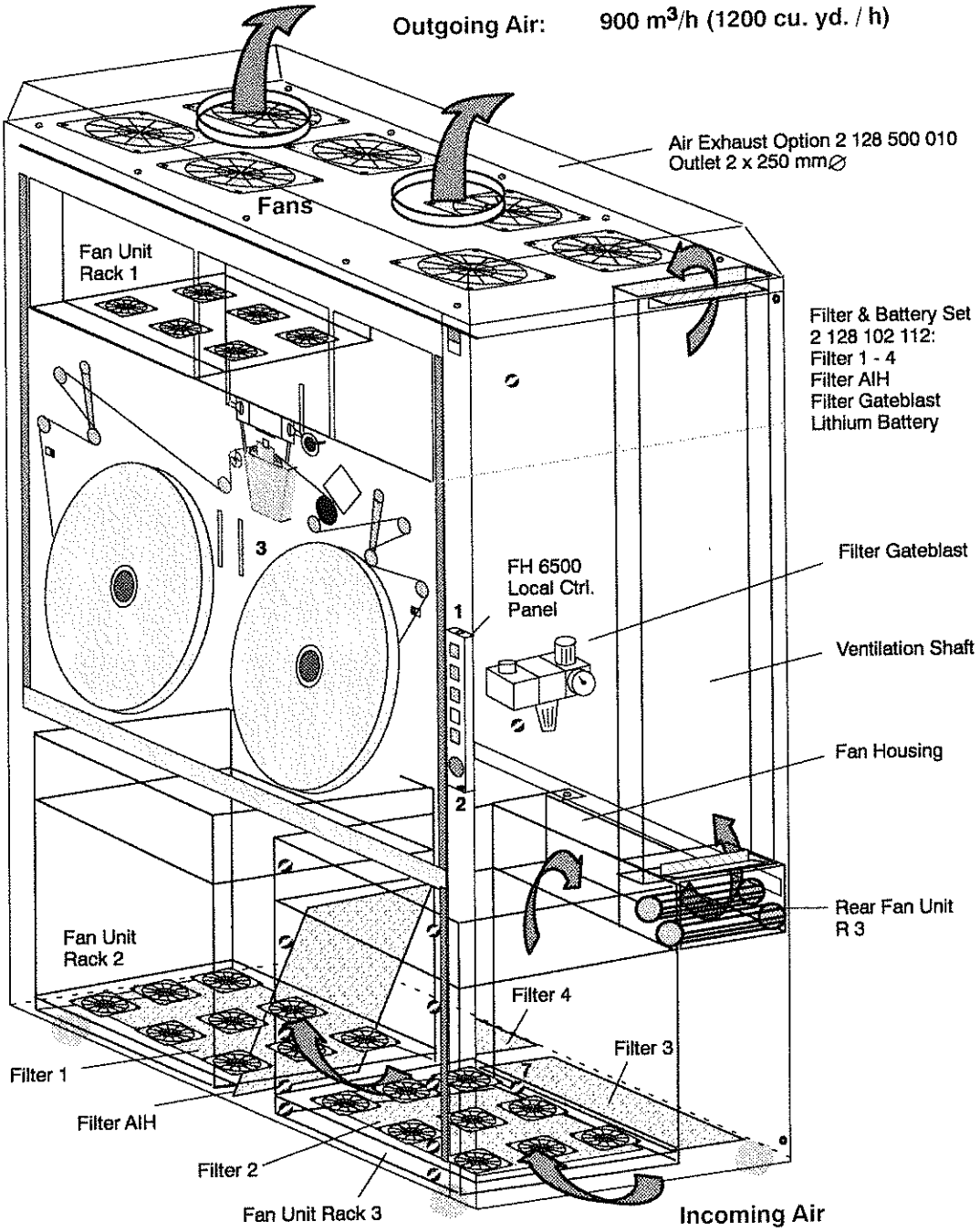


Fig. 402: Air ventilation system of the Spirit Datacine Film Scanner

4.3 INSTALLING LOCAL CONTROL PANEL FH 6500

The separately delivered Local Control Panel FH 6500 has to be installed to the SDC 2001 cabinet. Plug the Local Control Panel onto its connector at the right side of the cabinet. Fasten it with the two screws at its top and bottom (fig. 403/1, 2).

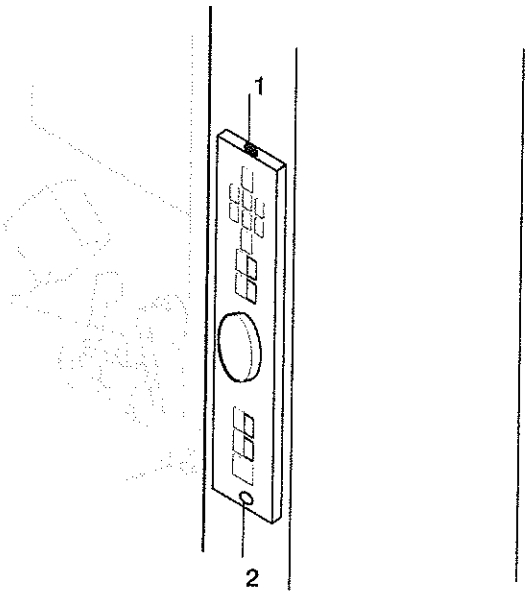


Fig. 403: Local Control Panel

4.4 INSTALLING HANDLES AT THE FRONT DOORS OF THE FILM DECK

The inside-mounted door handles (protection for transport) have to be mounted at the outside of the doors (fig.404). The mounting plates, washers and screws have to be mounted at the inside of the doors.

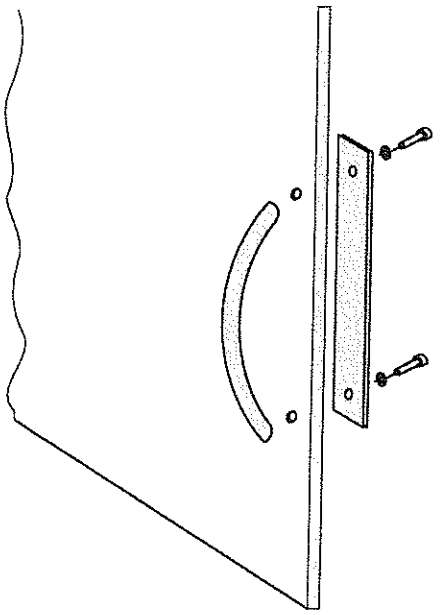
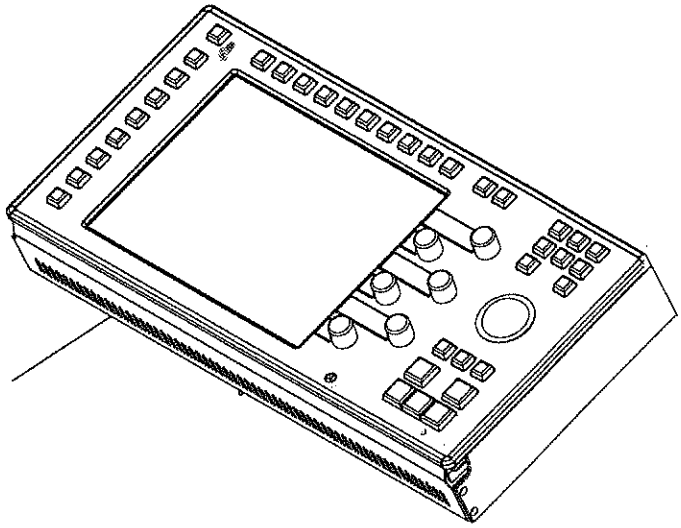


Fig. 404: Front door handle of the film deck

4.5 INSTALLING GRAPHICAL CONTROL PANEL

Note!

For operation, it is recommended to mount the panel into a desk or at the front of a 19-inch rack, details see the mounting instructions in the separate GCP1 manual.



Graphical Control Panel
GCP1

Fig. 405: Graphical Control Panel GCP1

It is connected to the film scanner via the internal machine communication system (iMCS) with a serial high-speed data transmission and is power supplied with an integral power supply unit 90V-230V AC.

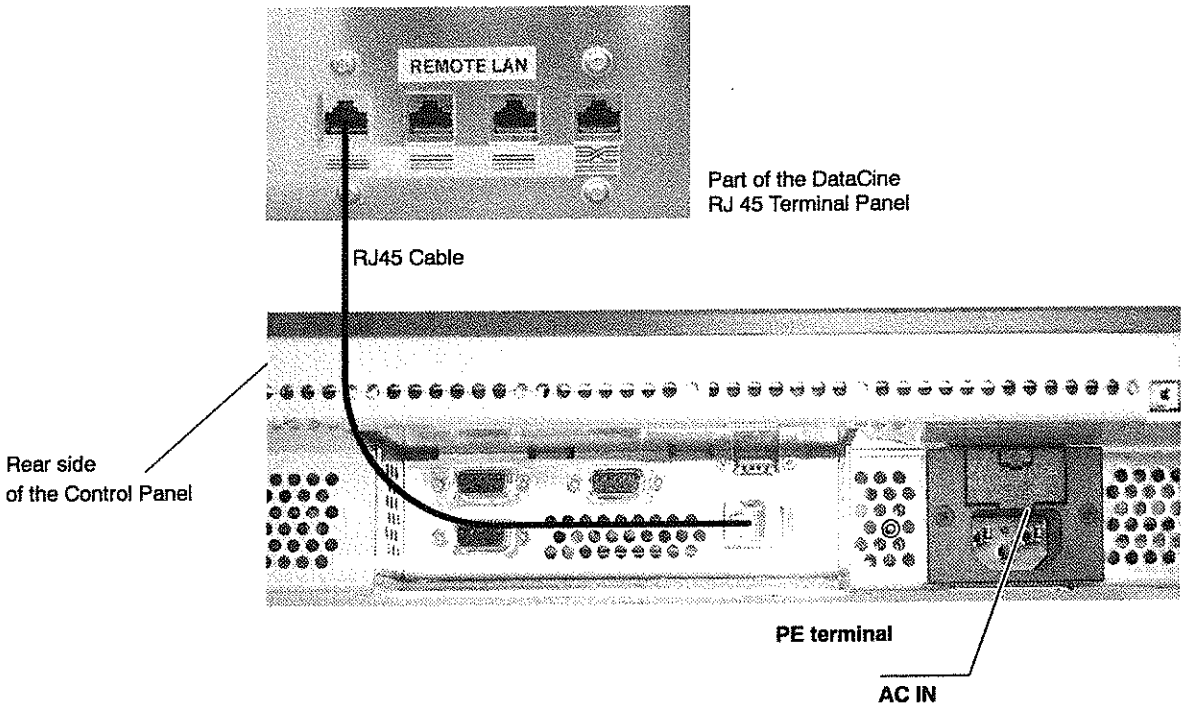


Fig. 406: Control panel connection to the Spirit DataCine

PE

The housing of the GCP1 panel is connected to protective earth (PE).

The panel has a PE terminal on rear. This PE terminal can be connected to a central earth system to prevent or eliminate EMC interferences.

4.5.1 INSTALLATION VARIATIONS

4.5.1.1 GCP1 Desktop mounting

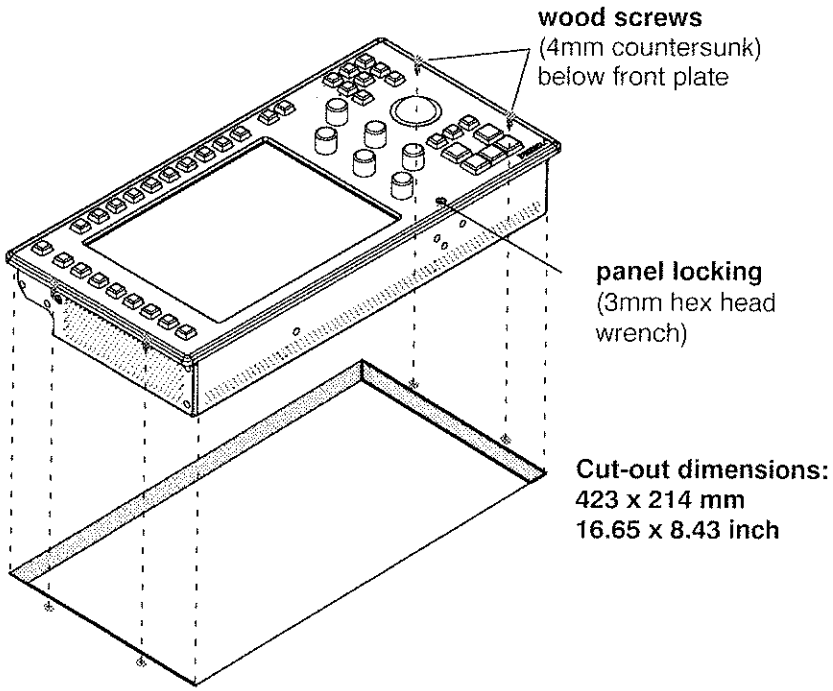


Fig. 407: GCP desk mounting

4.5.1.2 GCP1 Desktop mounting with table mounting set GCP-800 (swing mechanism)

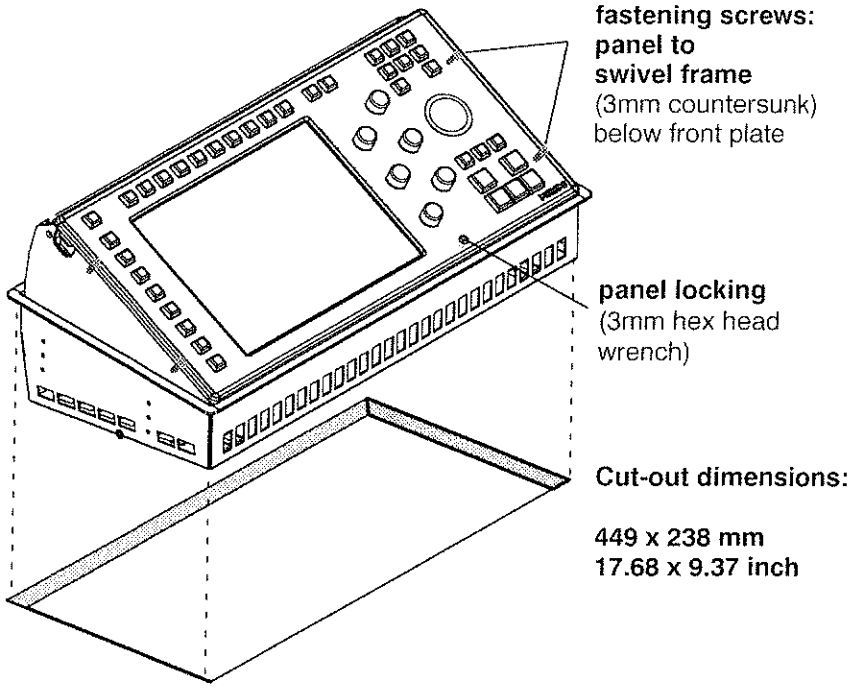


Fig. 408: GCP desk mounting version

4.5.1.3 GCP-1 Rack mounting with 19" standard mounting set

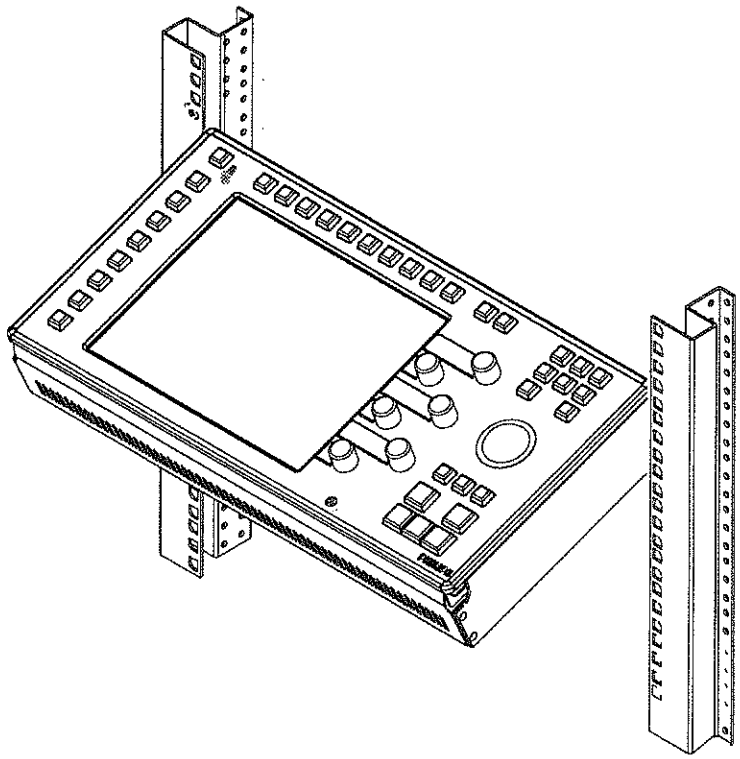


Fig. 409: GCP 19" rack mounted

4.5.1.4 GCP-1 Rack mounting with 19" rack mounting set GCP-900 (swing mechanismus)

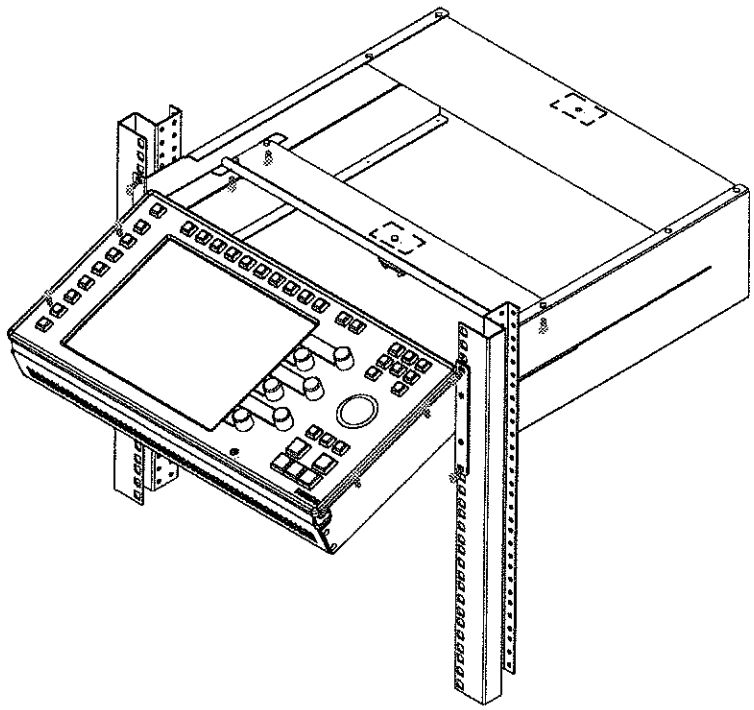


Fig. 410: GCP 19" rack mounted

4.6 REMOVING STYROFOAM ELEMENTS AND LOCKING DEVICES

Open the rear doors of the cabinet.

Remove Styrofoam Elements

The styrofoam element **5** stabilizes the Lamp Power Supply Unit and the Capstan Power Stage during transport. A second styrofoam element **6** stabilizes the Spooling Power Stage.

Both have to be removed!

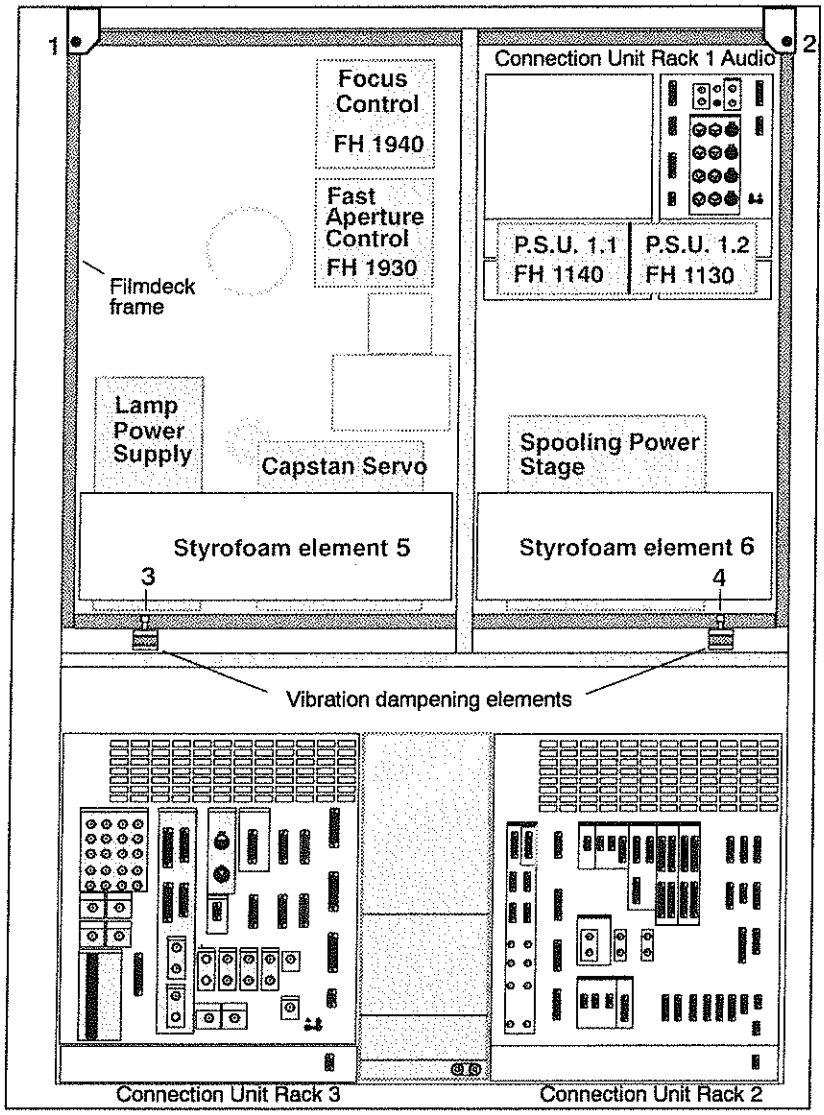


Fig. 411: **Film scanner,** rear view

Remove/Loosen Locking Screws

For fixing the filmdeck during transport, four locking screws are screwed into the filmdeck frame from the rear side, as shown in figure 411/1, 2, 3, 4.

The two upper locking screws (1, 2) in the left and right corner of the cabinet have to be removed, together with their spacers.

The two lower locking screws (3, 4) at the left and right side of the filmdeck bottom frame have to be loosened.
The Lamp Power Supply has to be swung out to reach the left locking screw.

4.7 REMOVING STYROFOAM ELEMENTS OF THE AIH FILM SCANNER

Remove Styrofoam Elements

Two styrofoam elements protect the two pre-amplifier boards within the AIH film scanner. They have to be removed before getting started.

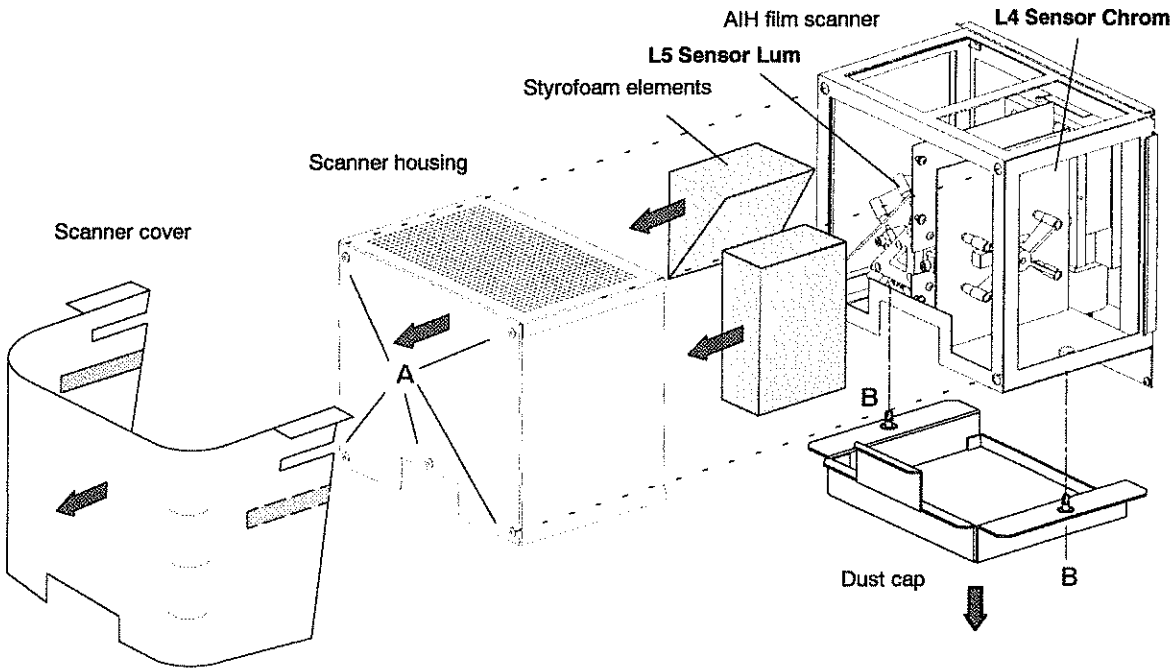


Fig. 412: AIH film scanner

1. **Pull out scanner cover**
   The scanner cover can be pulled out directly.

2. **Remove scanner housing**
   Open the five mounting locks **A** of the scanner housing by counterclockwise rotation with an appropriate screwdriver.

3. **Pull out styrofoam elements**
   Take care that p.c. boards will not be damaged.

4. **Connect coaxial cables to the pre-amplifiers**

The coaxial cables of the L 4/L 5 Pre-amplifiers are disconnected for protection due to the styrofoam elements during transport.

- Plug the four coaxial cables from the left side **(LA, LB, LC, LD)** to the **Luma Pre-amplifier** (Luma Sensor Board L5) as shown in figure 413.

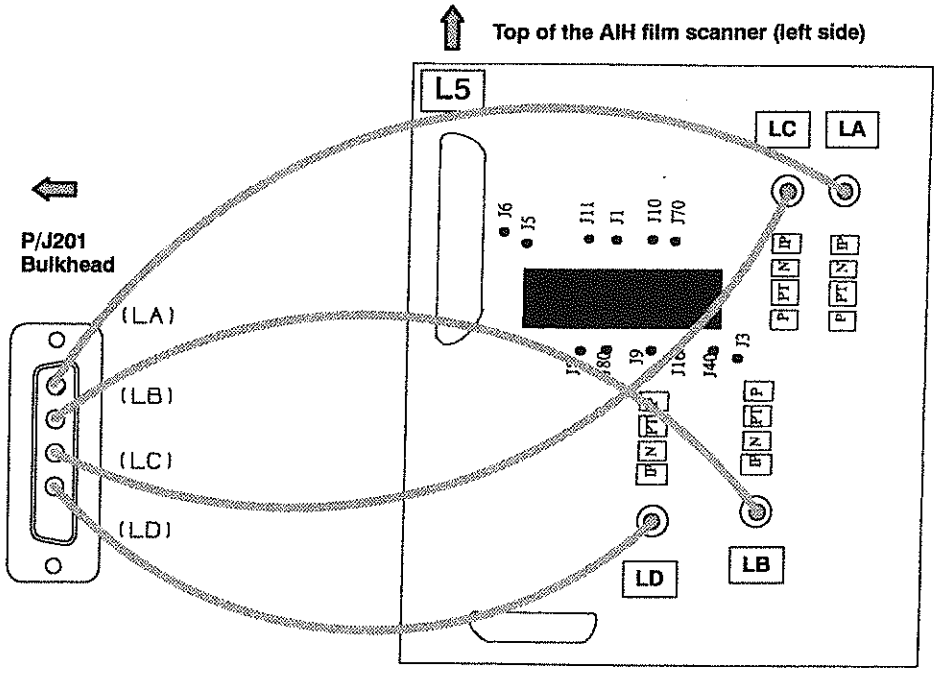


Fig. 413: **Luma pre-amplifier** (Luma Sensor Board L5)

- Plug the three coaxial cables from the right side **(RED, GRN, BLU)** to the **Chroma Pre-amplifier** (Chroma Sensor Board L4) as shown in figure 414.

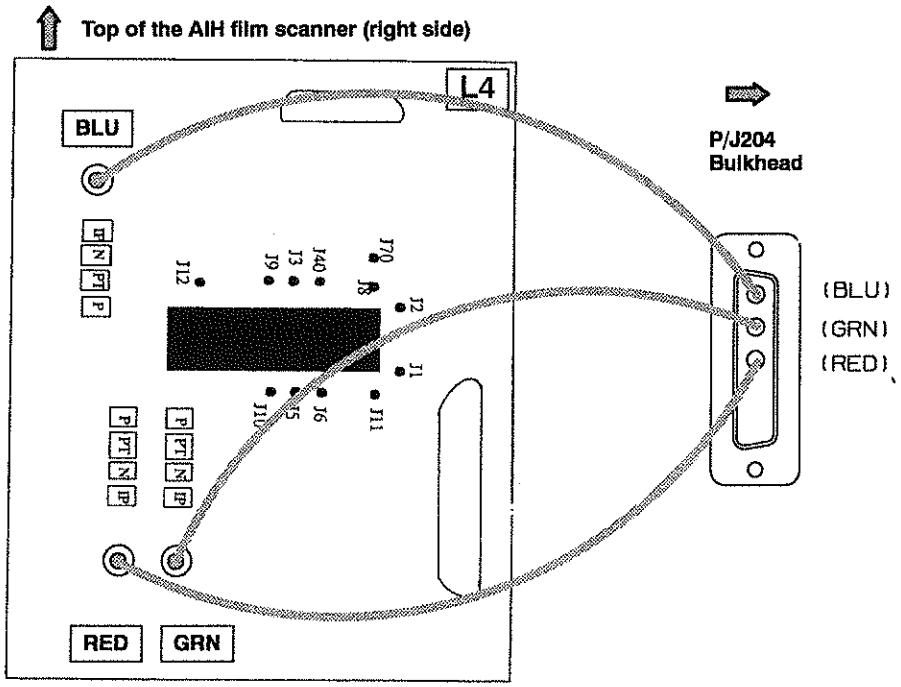


Fig. 414: **Chroma pe-amplifier** (Chroma Sensor Board L4)

5. **Remove dust cap**
   Open the two mounting locks **B** (fig. 412) of the dust cap by counterclockwise rotation with an appropriate screwdriver.

6. **Reinstall scanner housing**
   Fix scanner housing with the five mounting locks **A** (fig. 412).

7. **Reinstall scanner cover**
   Insert the scanner cover again.

4.8 INSERT CONDENSER LENSES, FILTERS AND XENON LAMP

Before transporting the film scanner, various condenser lenses, filters and the projection lamp have been removed from the unit.

Before turning on, insert the supplied condenser lens 2, four filters into the filter wheel, heat absorbing filter, hot mirror (infrared filter), condenser lens 1 and the projection lamp (Xenon lamp) into the lamp house, in this order.

Principle of illumination path

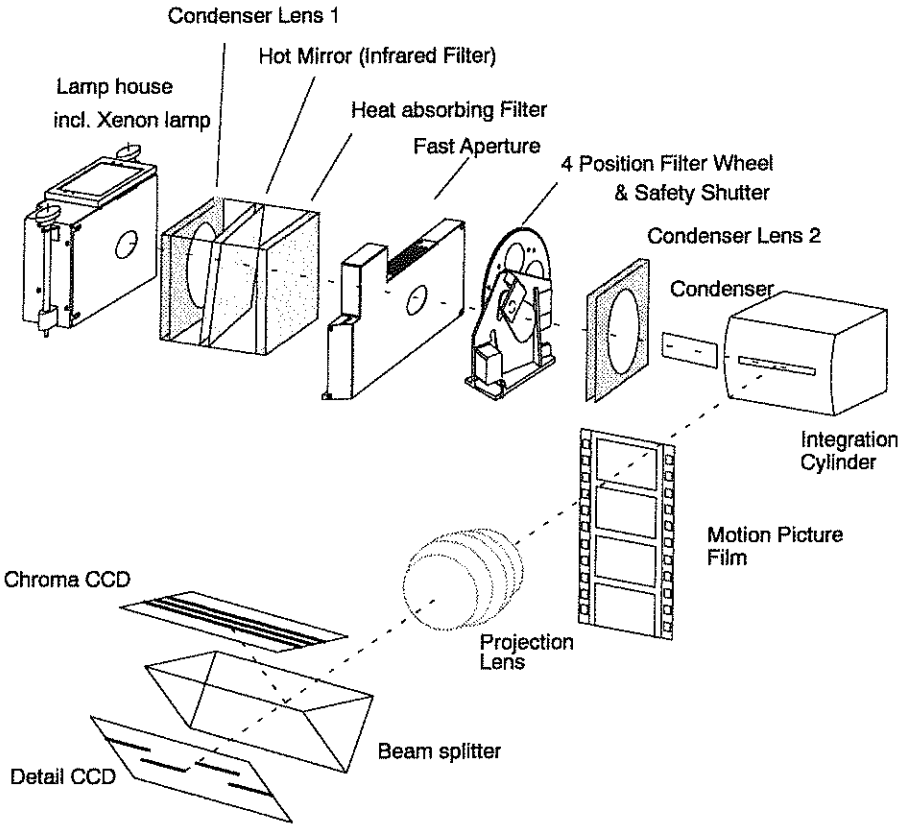


Fig. 415: Principle of illumination path

To install lenses and filters open the rear doors of the film scanner.

The carriers for lenses and filters are accessible from the cabinet rear and located approximately at the middle of the film deck plate.

To protect the optical elements against dirt and finger prints while inserting, always wear thin cotton gloves or use a piece of optical cleaning cloth to grasp them.

The lenses and filters had been packed in clean condition.
In exceptional case, if necessary, clean the parts with optical cleaning cloth, order no.: 5 001 310 280, that has been moistened with isopropyl alcohol.

Insert the two condenser lenses and the filters into the corresponding carrier **in following order:**

- **Demount lamp house**
  Demount the lamp house to gain access to filter and lens carriers.
  To do this, loosen the two knurled screws, see fig. 416.
  Pull the lamp house upwards (out of its fitting pins) and remove it.

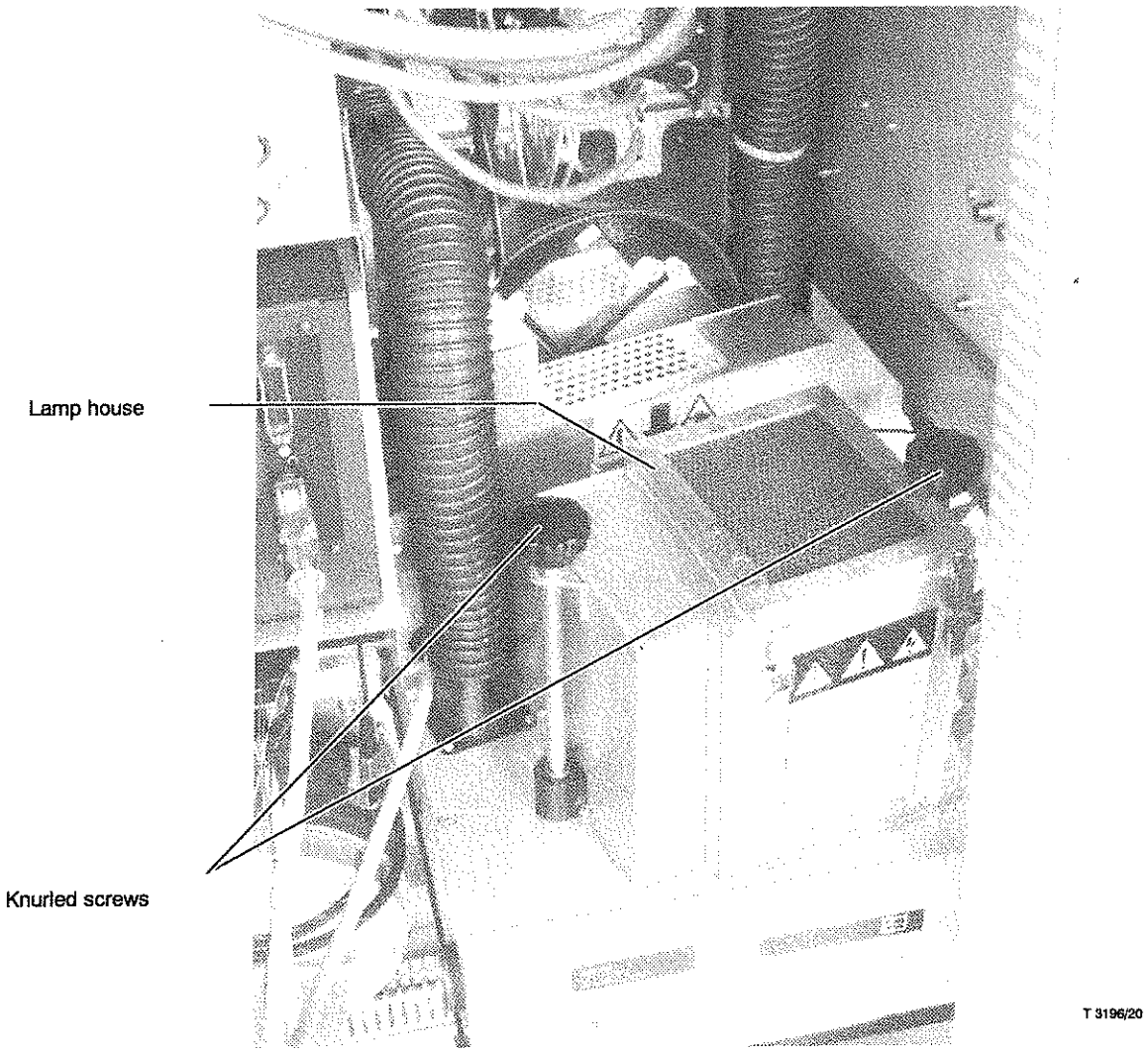


Fig. 416: Lamp house

- **Insert condenser lens 2**
  The larger one of the two supplied lenses (with metal frame) has to be installed into the carrier which lies directly behind the filter wheel.
  The upper small borehole has to be positioned to the guide pin at the right side.
  Press the locking spring of lens carrier to the left and insert the lens in downward direction, while watching through an opening of the filter wheel.
  The mounting position is defined. See fig. 417.

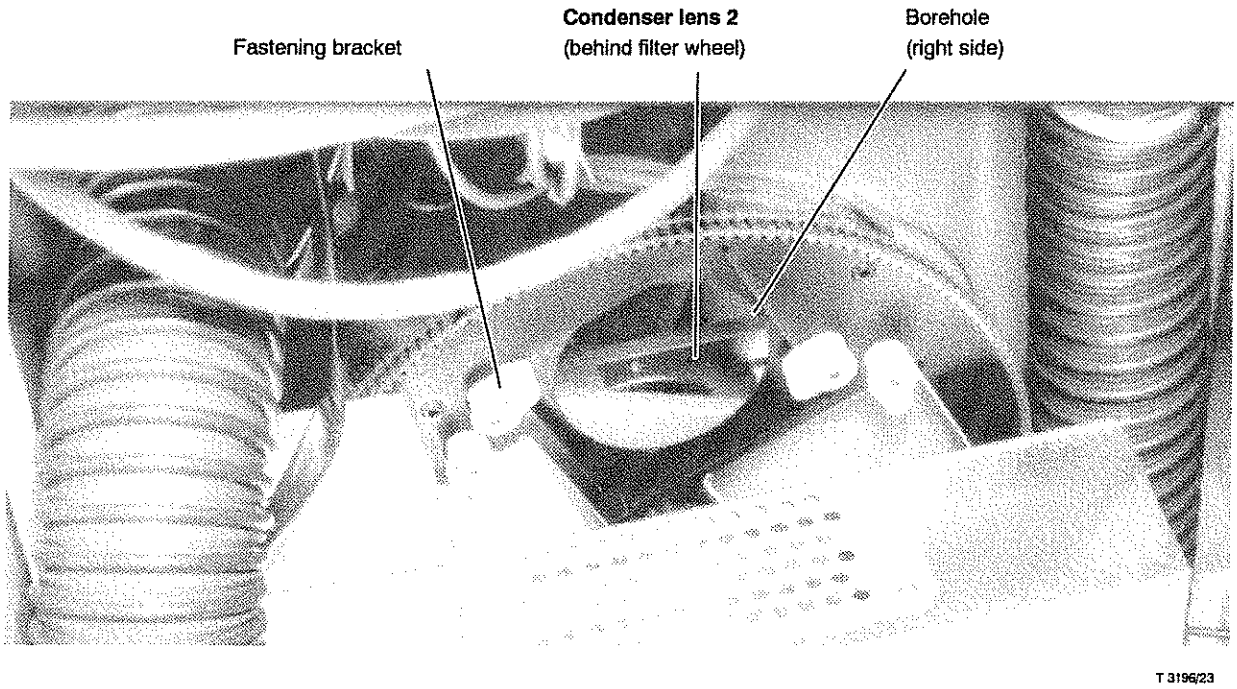


Fig. 417: Condenser lens 2

- **Insert four dichroic filters into filter wheel**
  Revolve the filter wheel so that a filter opening stands upside.
  Move the two fastening brackets of the filter to the side.
  Note the mounting position notation at the filter opening and at the dichroic filter (noted at one small edge): **POS., NEG., IMED.** or **PTV1**.
  Note also different edge lengths.
  Insert the respective filter.
  The fastening brackets have to lock in with an audible click.

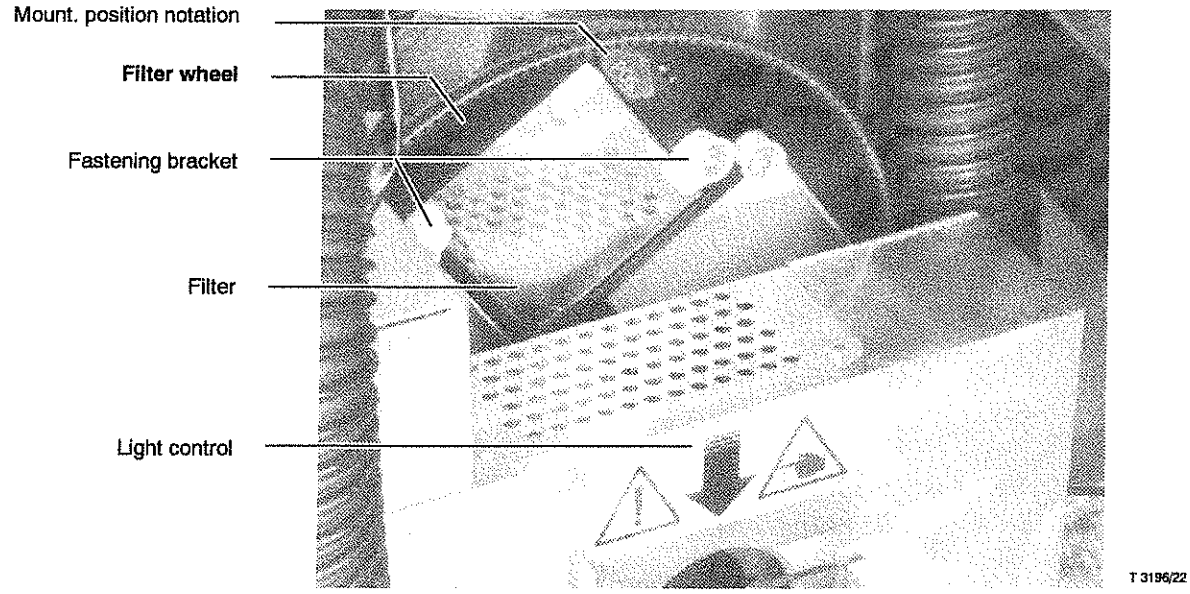


Fig. 418: Filter wheel

- **Insert heat absorbing filter**
  Press the locking spring of the filter to the left and insert the filter in downward direction, mounting position is defined.

- **Insert hot mirror (infrared filter)**
  Note the mounting position mark (a black point in one corner of the filter).
  The filter side with the black point has to be directed to the lamp house.
  Press the locking spring of the filter to the left and insert the lens in downward direction, mounting position is defined.

- **Insert condenser lens 1**
  The upper small borehole has to be positioned to the guide pin at the right side.
  Press the locking spring of condenser lens 1 to the left and insert the lens in downward direction, mounting position is defined.

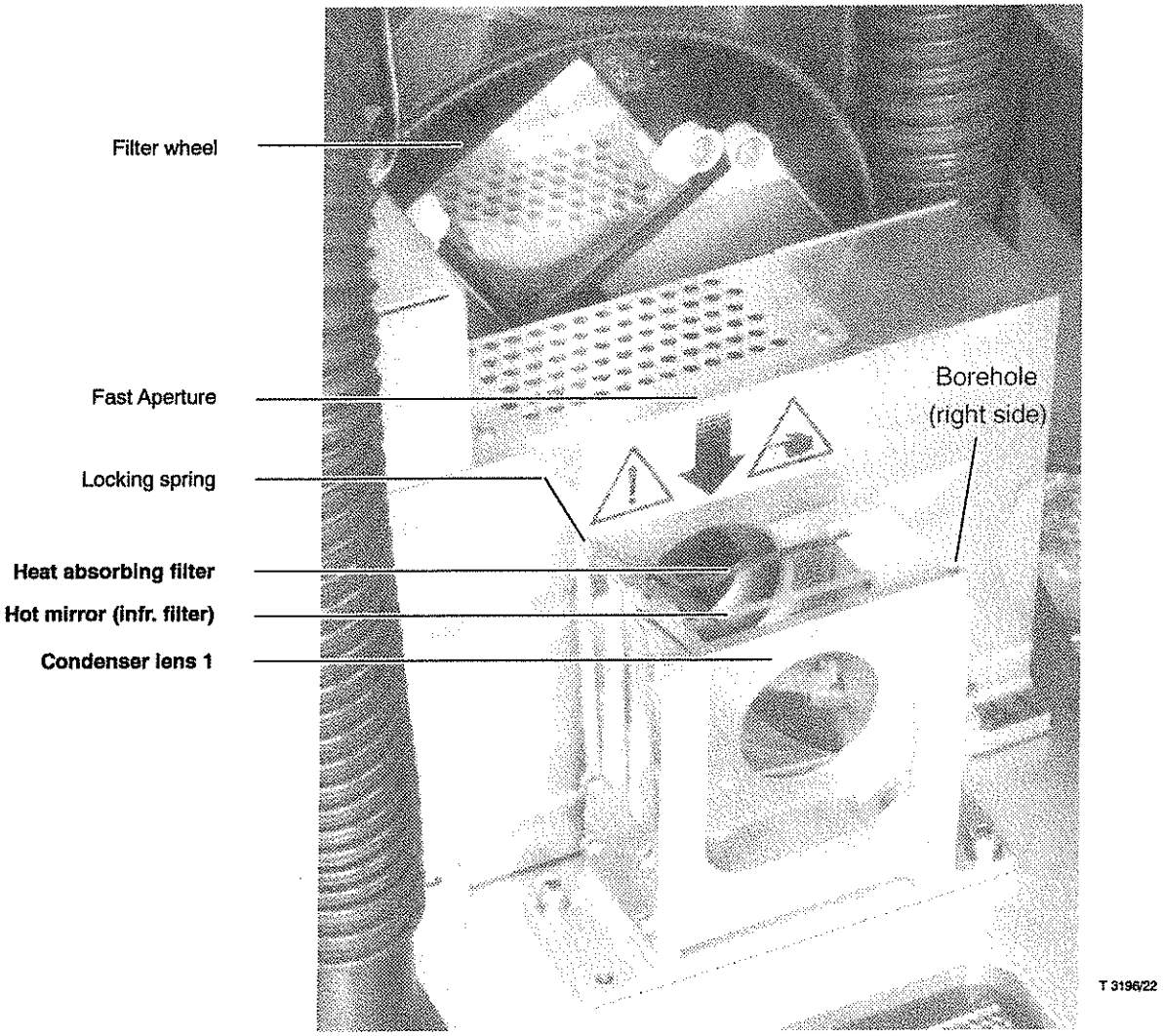


Fig. 419: Condenser lens 1, infrared filter, heat absorbing filter

ATTENTION: **The following works must be carried out with protective goggles and protection gloves. Danger of explosion! The Xenon lamp has a pressure of approx. 8 to 30 bar = 100 to 400 lb /sq. inch (cold/hot).**

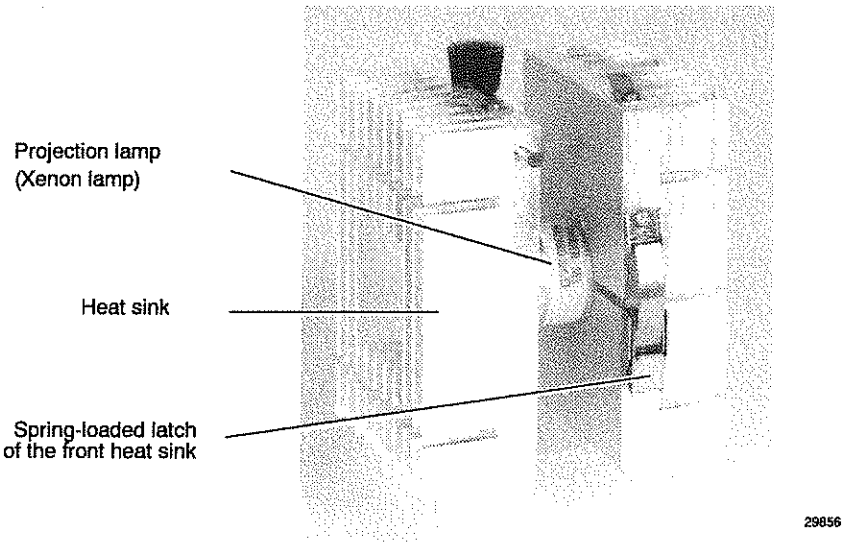


Fig. 420: Projection lamp (Xenon lamp) with heat sinks

- **Insert the projection lamp (Xenon lamp) into the lamp house**
  Open the spring-loaded latches of the disassembled lamp house and tilt the case lid upwards, see fig. 421.
  Insert the projection lamp with the mounted heat sinks into the case.
  Connect both connection cables to the heat sinks.
  Close the case lid with the spring-loaded latches.
  Insert the lamp house into its fitting pins and fasten it with its knurled screws, see fig. 416.

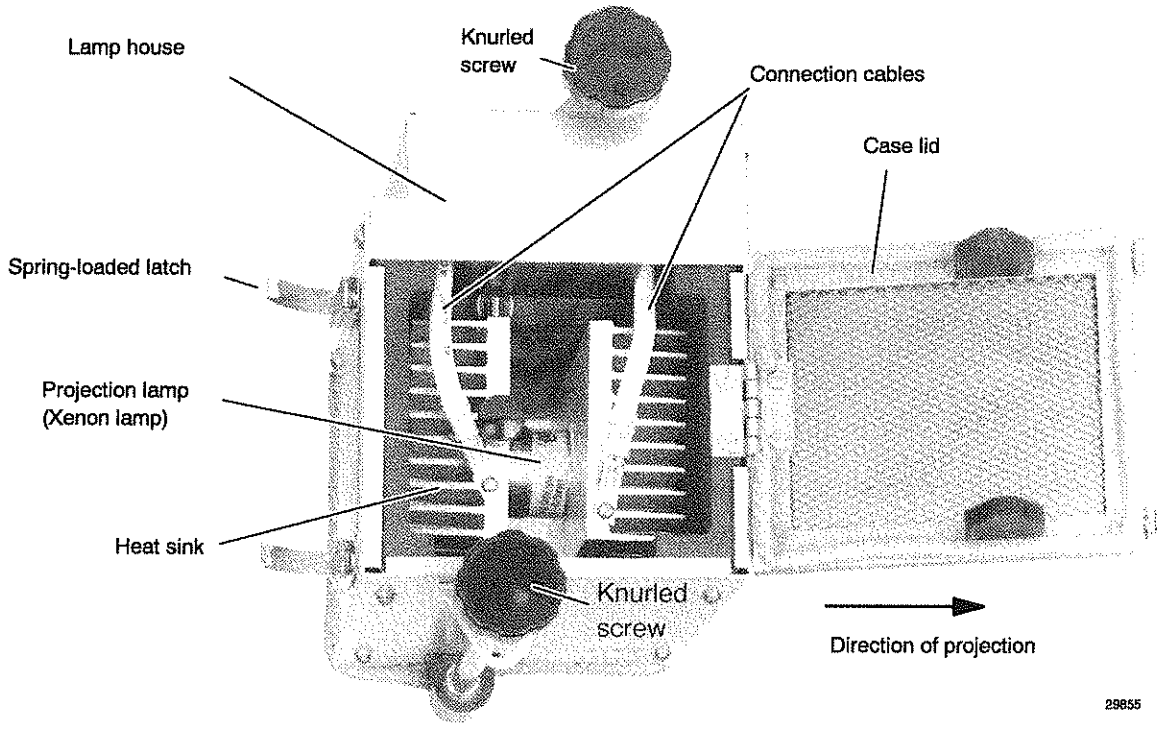


Fig. 421: Lamp house (opened)

4.9 INSTALLING THE LENS GATE ASSEMBLY LGA

Installing the appropriate LGA (Super16mm, ACA35mm, FA 35mm LGA) optically matches the film scanner to the respective film format.

1. Move the locking lever to the right of the LGA in an upwards ccw direction.
2. Grasp the LGA by the two handles and set the unit on the guide rails and slide it slowly towards the film deck plate until it fits.

Attention! ***Do not cant the lens gate assembly while sliding it in to avoid damaging the light sensor!***

3. Lock the lever beside the LGA (position LOCK).

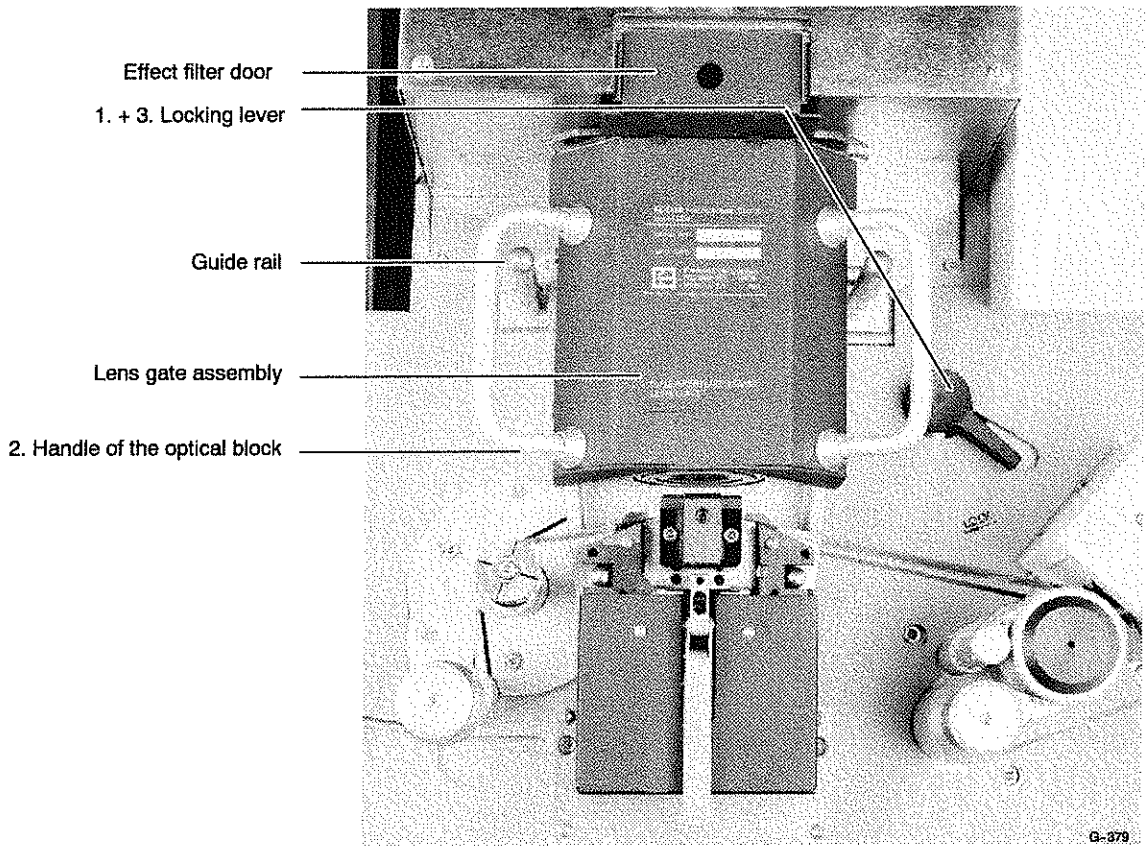


Fig. 422: Installed Lens Gate Assembly

Note!
For the usage of the optical effect filters, see chapter 3 in the Operation Instructions.

4.10 INSTALLATION OF KEYCODE READERS

4.10.1 Safety Instructions

Precaution when installing the Keycode Reader

- To reduce risk of electric shock, do not perform any installation without switching off the SDC 2002 Film Scanner.
- Observe EMC regulations!

  To avoid EMC problems, all keycode reader cables must be wrapped in knitted wire mesh tape.
  The so shielded cables must be connected to ground potential at the SDC 2002 film deck and at the EMC-terminal panel via the corresponding cable feed-through.

Precaution when operating!

Pay attention to the film guide, danger of scratching the film!

- Check the proper film run always with a test film.
- The film should never contact the knurled fixing knobs of the keycode readers.
- Do not run the film through the keycode readers when the devices are in park position.
- Do not change the position of the keycode reader during any SDC 2002 operation!
- Do not use a film loop when a keycode reader is in park position.
- Never mount the "keycode reader mounting plates" without heads on the base plate.
- Do not mount single keycode heads in the positions which are designed to be used in combination of an ARRI head together with EVERTZ or AATON units.

4.10.2 General

The Keycode Reader Mounting Set, separately delivered with the SDC 2002, is designed to facilitate the installation of the 16mm / 35mm keycode readers from the manufacturers AATON, EVERTZ and ARRI.

The mounting set consists of the following parts:

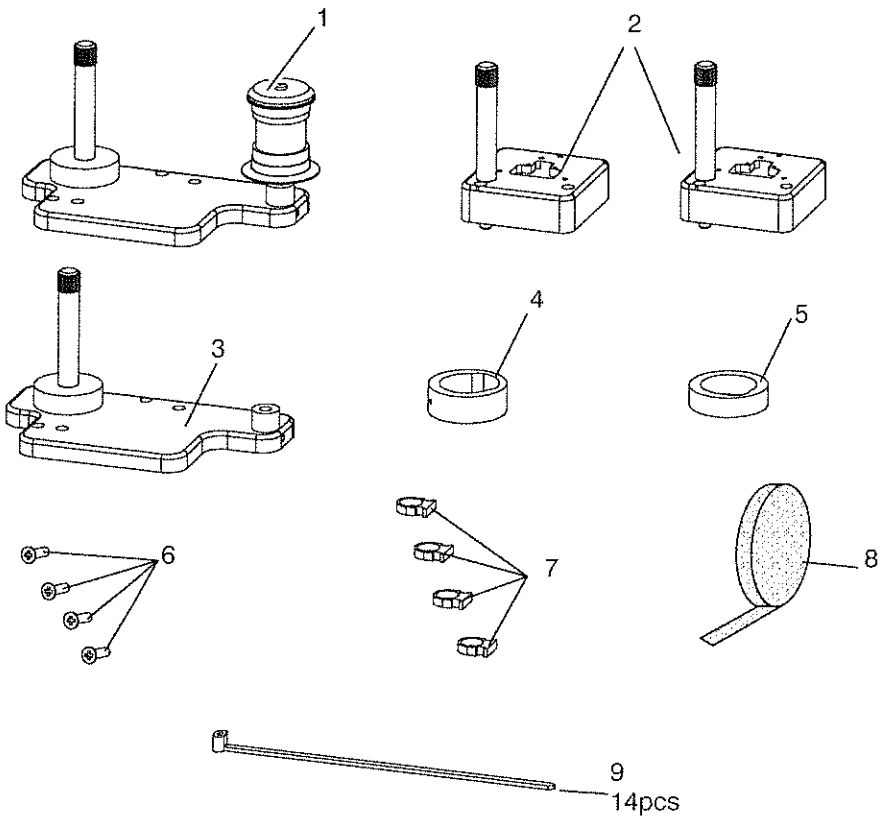


Fig. 423: Mounting Set Keycode Reader

Pos.	Pcs	Designation
1	1	Mounting plate with knurled knob and roller for AATON reader
2	2	Mounting plate with knurled knob for 16mm & 35mm ARRI reader
3	1	Mounting plate with knurled knob for EVERTZ reader
4	1	Spacer ring for damping roller / base plate
5	1	Clamping ring for damping roller
6	4	Phillips screw M3
7	4	Fixing plate for cable tie
8	1	10 meters shield wrap knitted wire mesh 1.5 inch wide
9	14	Cable tie

The base plate feature "Park Position" enables to set a reader from the read position into the park position without the need to disconnect the cables of the reader.

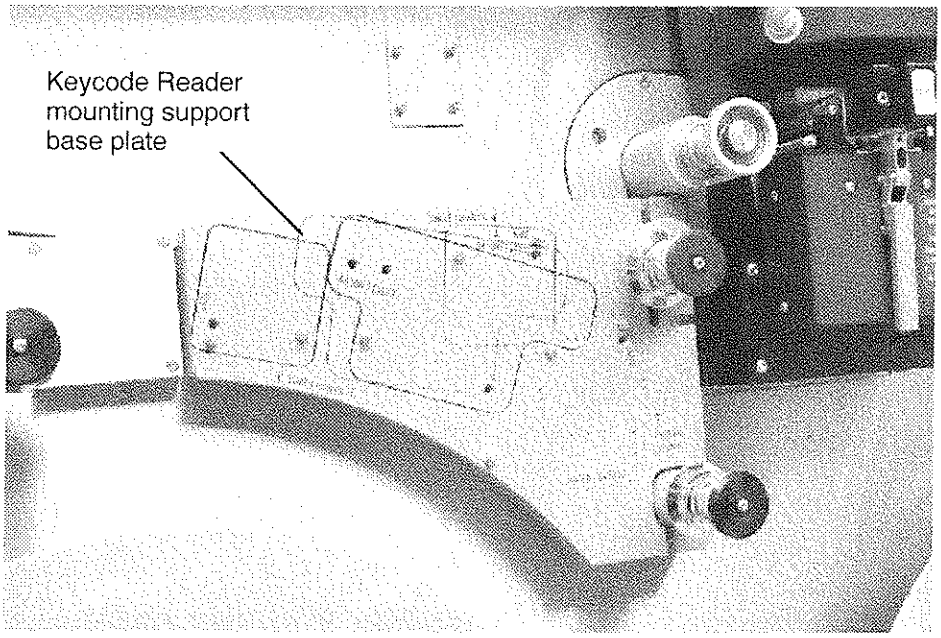


Fig. 424: Base Plate

Note! **For instructions relating to the specific adjustment of the keycode readers themselves, please refer to the documentation of the respective manufacturer AATON, EVERTZ and ARRI.**

4.10.3 TOOLS REQUIRED

Installation of the the mounting support requires the following tools:

4. Allan key 2 mm
5. Allan key 2.5 mm
6. Allan key 3 mm
7. Phillips screw driver
8. Screw driver size 1

4.10.4 MOUNTING THE KEYCODE READERS ON THE RESPECTIVE MOUNTING PLATE

4.10.4.1 ARRI Keycode Reader

1. Lead the Mini Sub-D connector (1) Figure 425 of the ARRI reader cable from below through the opening (2) of the ARRI mounting plate.

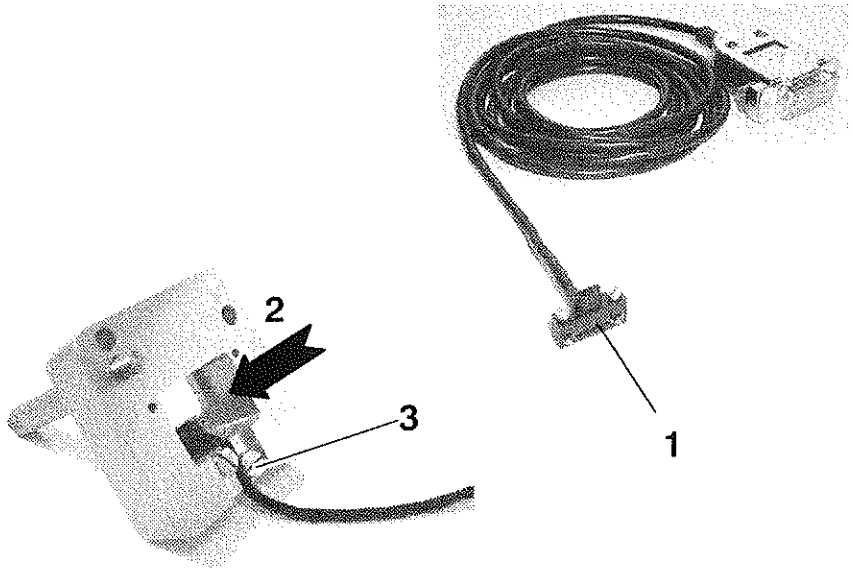


Fig. 425:

2. Fasten the Mini Sub-D connector with two screws (4) Figure 426 (parts of the ARRI reader) on the top side of the ARRI mounting plate. Put the cable into the groove at the bottom side of the ARRI mounting plate and fix it with the two slotted screws (3) Figure 425.

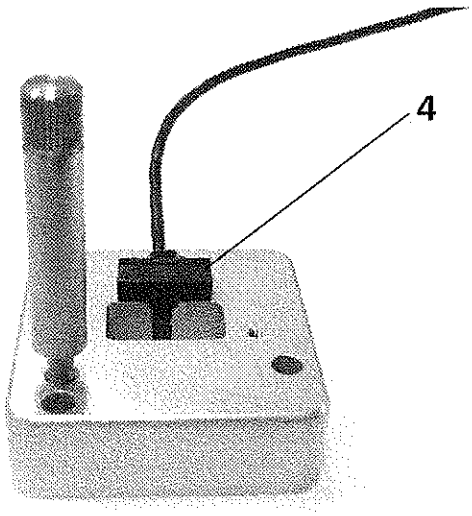


Fig. 426:

3. Slide the ARRI 16mm or 35mm keycode reader (1) onto the mounted ARRI Mini Sub-D connector (2) and fasten it with the two hex socket-head screws (3) Figure 427 (parts of the keycode reader) using an Allan key of 2.5 mm. The keycode reader is now mounted on its base plate.

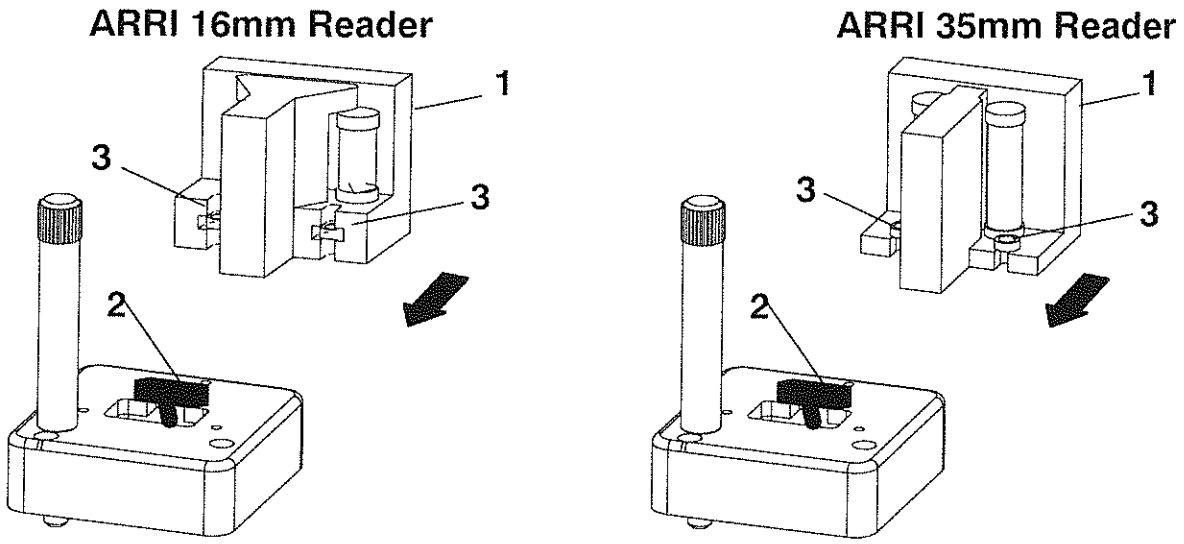


Fig. 427: ARRI mounting plate and ARRI reader

4.10.4.2 AATON Keycode Reader

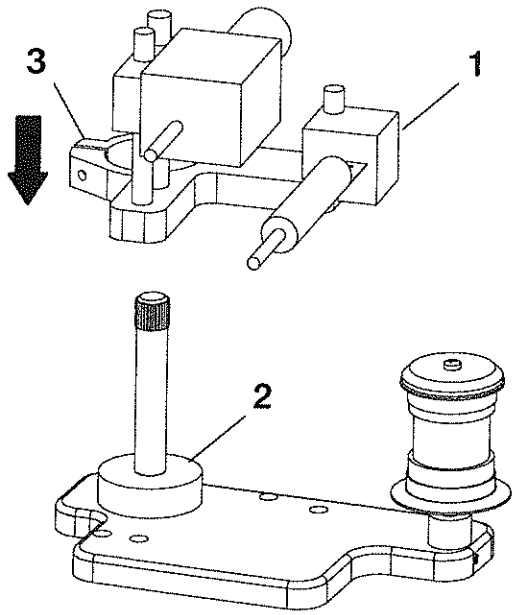


Fig. 428: AATON mounting plate and reader

Put the AATON keycode reader (1) onto the clamp fitting (2) and clamp it with the hex socket-head screw (3), Figures 428 and 429.

Preadjustment:
Adjust the position of the AATON reader in such a way that the edge of the reader (4) is in parallel to the edge of the mounting plate (5), Figure 429.

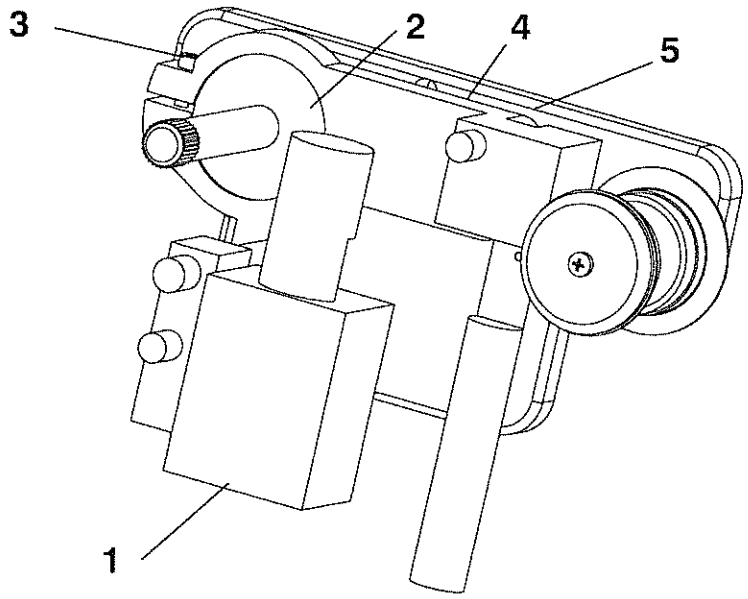


Fig. 429: AATON keycode reader on AATON mounting plate

4.10.4.3 Evertz KeyCode Reader

Put the **EVERTZ** keycode reader (1) onto the clamp fitting (2) and clamp it with the hex socket-head screw (3).

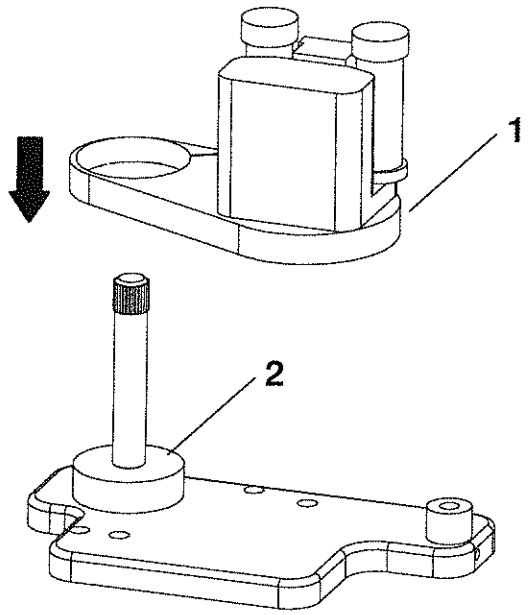


Fig. 430: EVERTZ mounting plate and reader

Preadjustment:

Adjust the position of the EVERTZ reader in such a way that the pin hole (4) is covered half by the EVERTZ reader (1)!

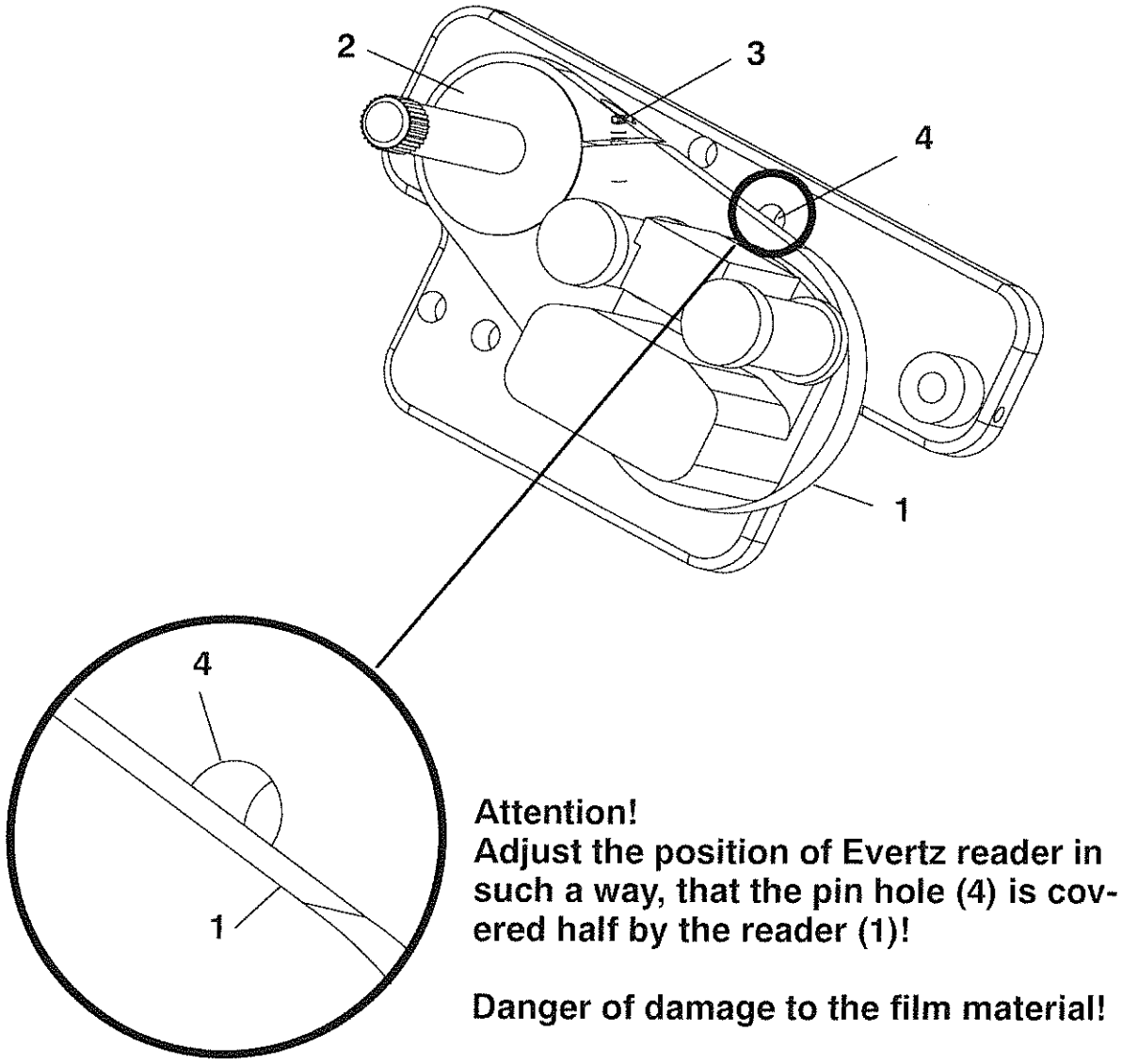

2
3
4
1
4
1
Attention!
Adjust the position of Evertz reader in such a way, that the pin hole (4) is covered half by the reader (1)!
Danger of damage to the film material!

Fig. 431: EVERTZ keycode reader on EVERTZ mounting plate

4.10.5 MOUNTING A SINGLE KEYCODE READER ON THE BASE PLATE

Fig. 432 and Fig. 433 show the mounting positions of the keycode readers when using one keycode reader. The thin outlines on the base plate show the single reader positions.

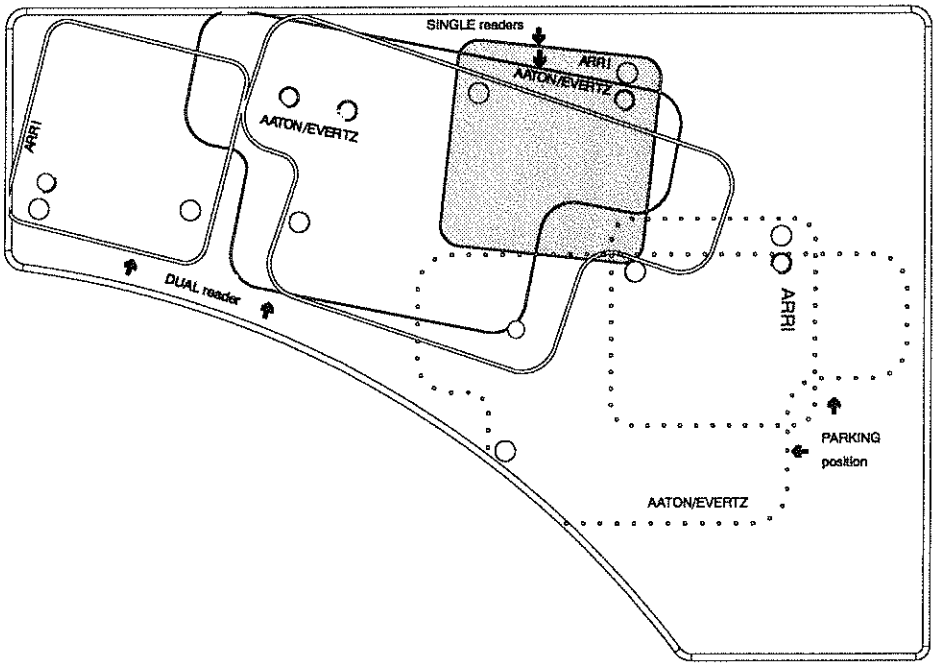


Fig. 432: One Keycode reader position (ARRI)

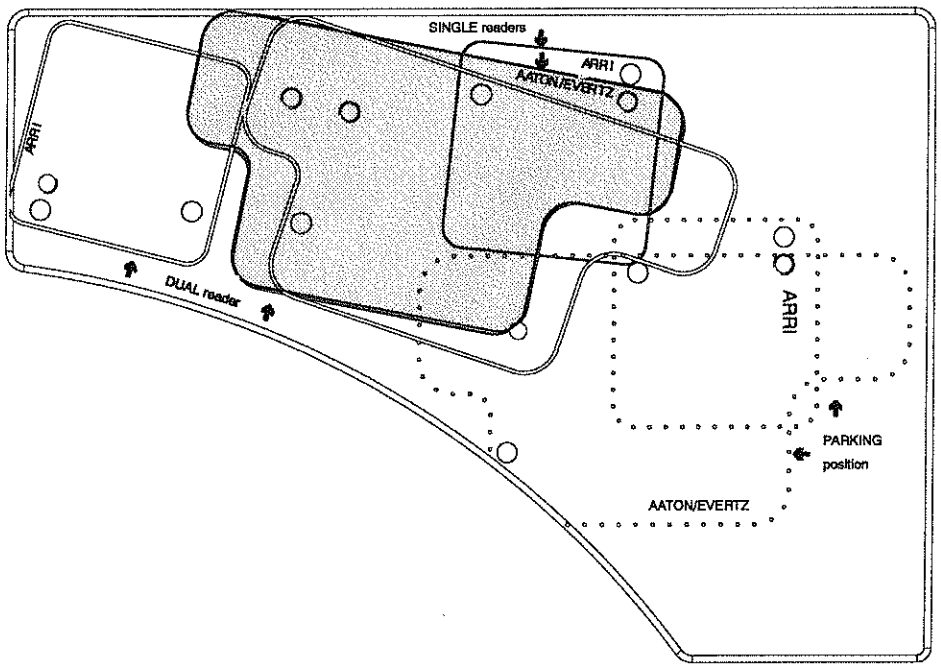


Fig. 433: One Keycode reader position (AATON/EVERTZ)

Note! **When using one keycode reader, put it only on its single position (gray areas Fig. 432 & Fig. 433, thin line on the base plate). When setting readers on the dual position, the film may be scratched!**

4.10.5.1 Mounting Keycode Reader ARRI

Put the ARRI keycode reader (16 or 35 mm) with its mounting plate in the provided position for the single operation onto the base plate and fasten it with the knurled screw (1), see Fig. 434.

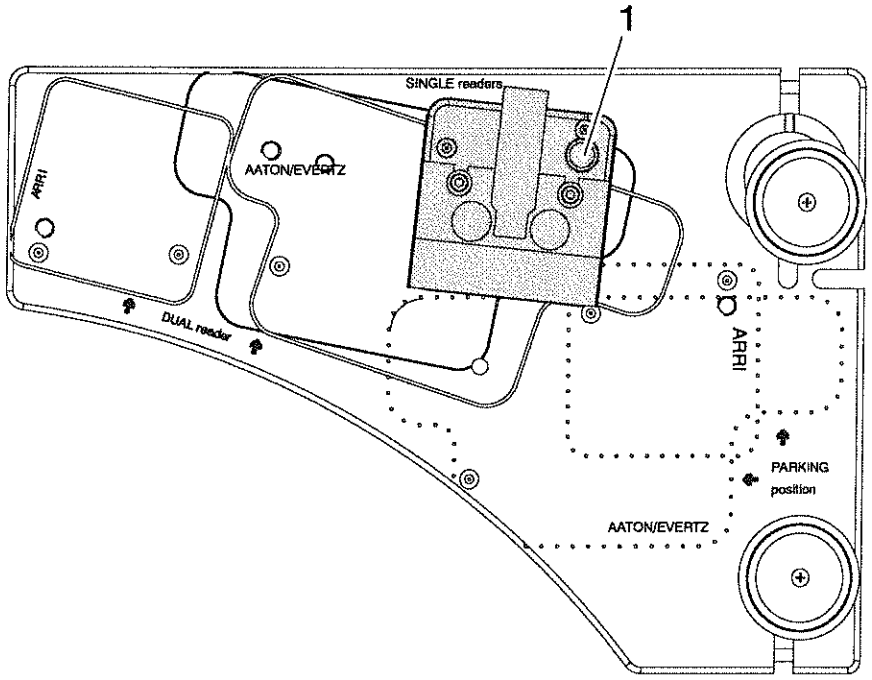


Fig. 434: ARRI reader in single position

4.10.5.2 Mounting Keycode Reader Evertz

Put the EVERTZ keycode reader with its mounting plate in the provided position for the single operation onto the base plate and fasten it with the knurled screw (1), Fig. 435.

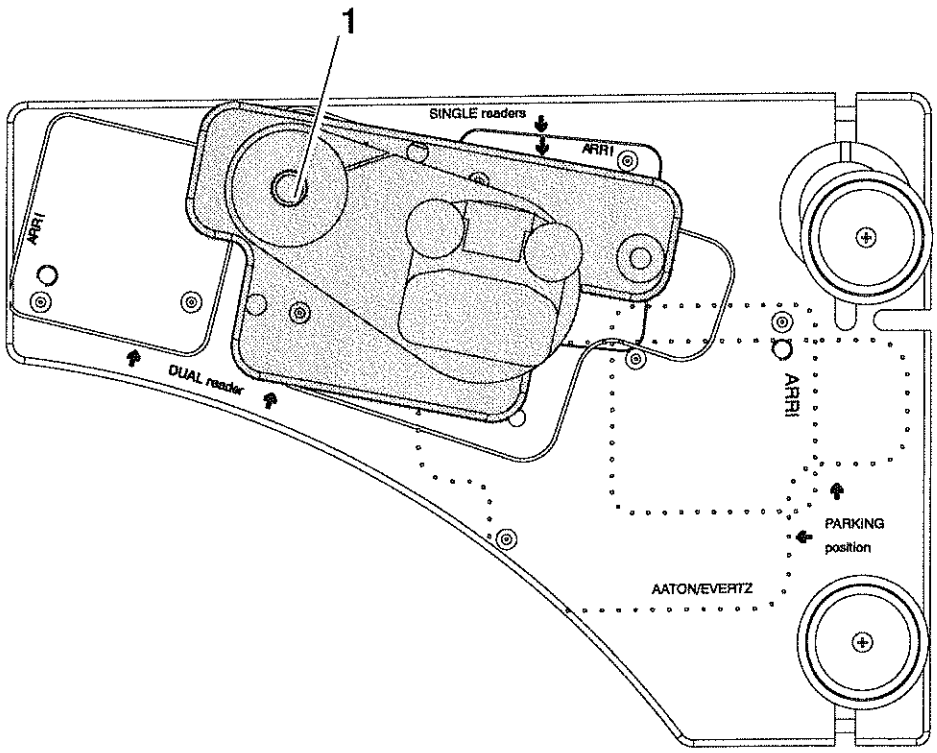


Fig. 435: EVERTZ keycode reader in single position

The keycode reader has to be fasten on the clamp fitting in such a way that it does not impede the film run and does not scratch the film.

Note! **See Evertz manual for fine adjustment of the keycode reader head!**

4.10.5.3 Mounting Keycode Reader AATON

Put the **AATON** keycode reader with its mounting plate in the provided position for the single operation onto the base plate and fasten it with the knurled screw (1), see Fig. 436.

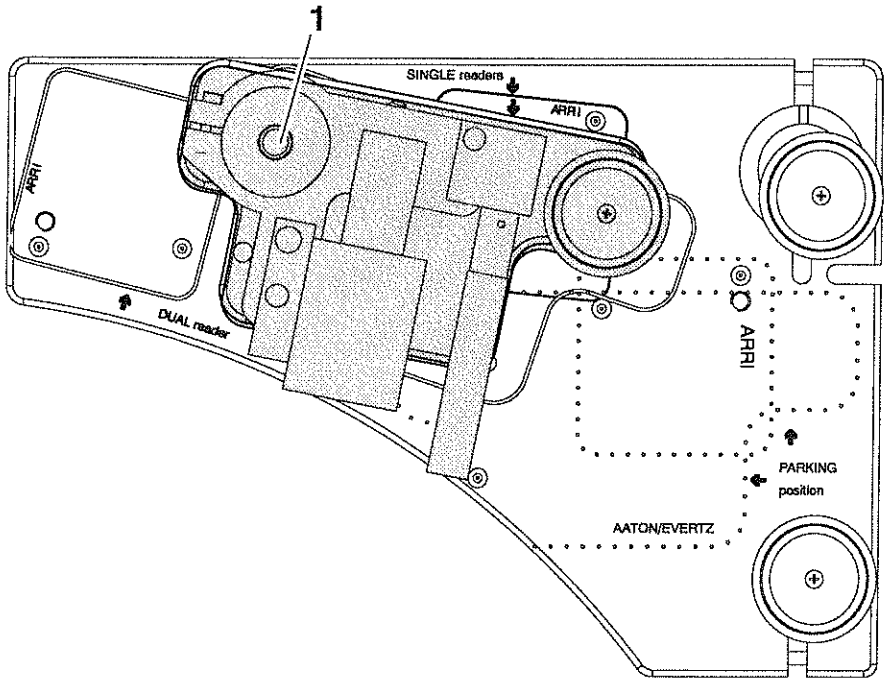


Fig. 436: AATON keycode reader in single position

The keycode reader has to be fasten on the clamp fitting in such a way that it does not impede the film run and does scratch the film.

Note! **See AATON manual for fine adjustment of the keycode reader head!**

4.10.6 DEFLECTION ROLLER ADJUSTMENT (AATON READER)

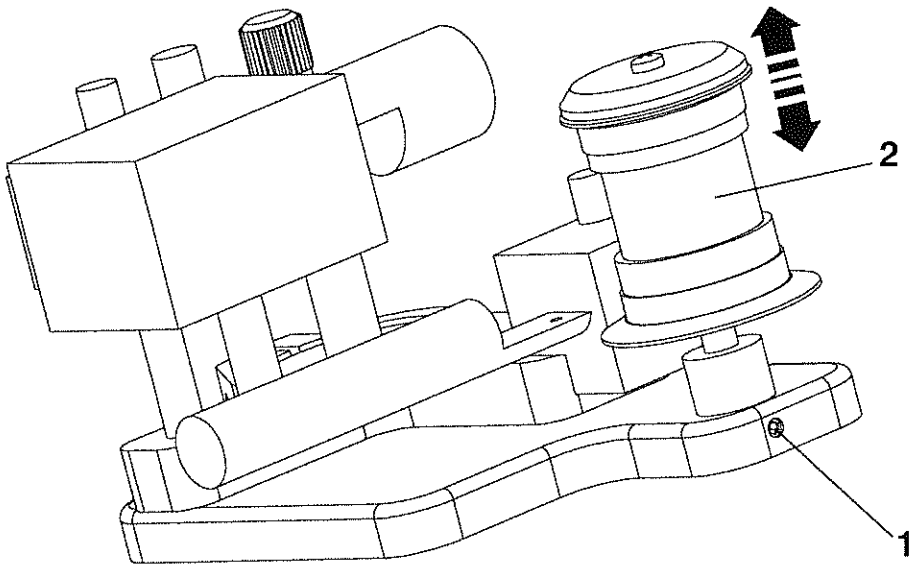


Fig. 437: Deflection roller adjustment

For adjusting the additional AATON deflection roller (2), loosen the clamp screw (1) with an Allan key and adjust the deflection roller (2) according to Fig. 438. Tighten the clamp screw (1) again.

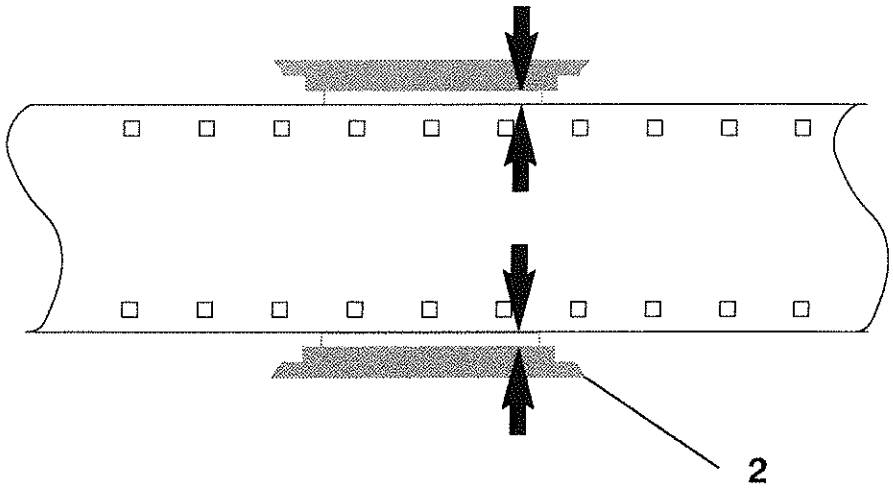


Fig. 438: Film run adjustment

Make sure that the film edges **do not touch the edges** of the guide roller (2).

4.10.7 PARKING POSITION OF THE KEYCODE READERS

ATTENTION!
Do not use a film loop when a keycode reader is mounted in parking position!

4.10.7.1 Parking Position of the AATON / EVERTZ Reader

When the AATON or EVERTZ keycode reader is not used, mount it in its parking position. For this purpose, put the reader on the parking position and fasten it with the knurled screw.

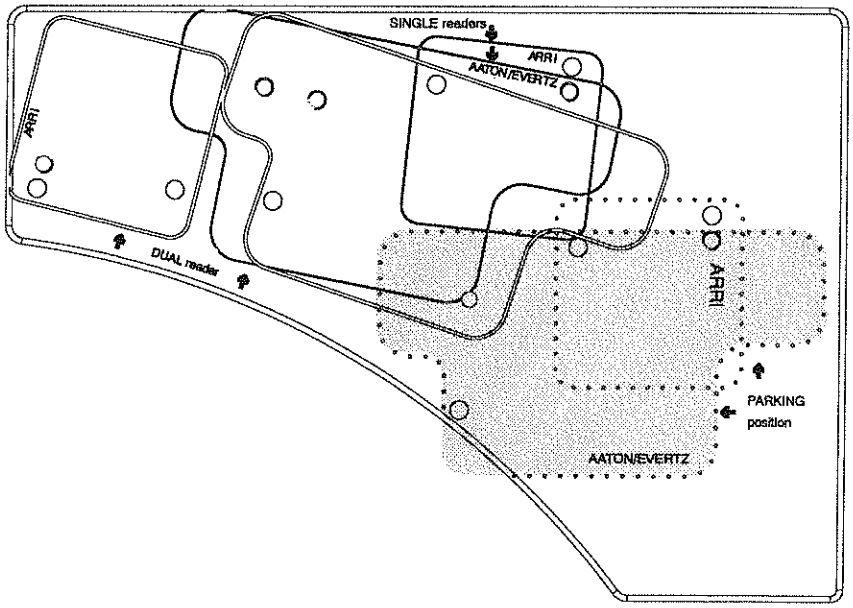


Fig. 439: Parking position for AATON/EVERTZ keycode reader

4.10.7.2 Parking Position of the ARRI READER

When the ARRI keycode reader is not used, mount it in its parking position. For this purpose, loosen the knurled screw, put the reader on the parking position and fasten it with the knurled screw.

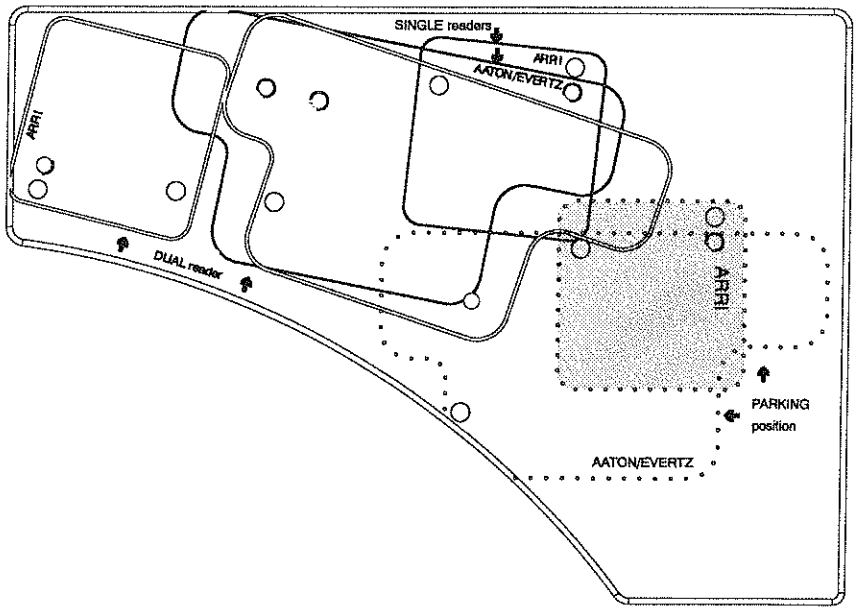


Fig. 440: Parking position for ARRI keycode reader

4.10.8 MOUNTING TWO KEYCODE READERS

Fig. 441 shows the mounting positions of the keycode readers when being used in dual operation. The bold lines on the base plate show the dual reader positions.

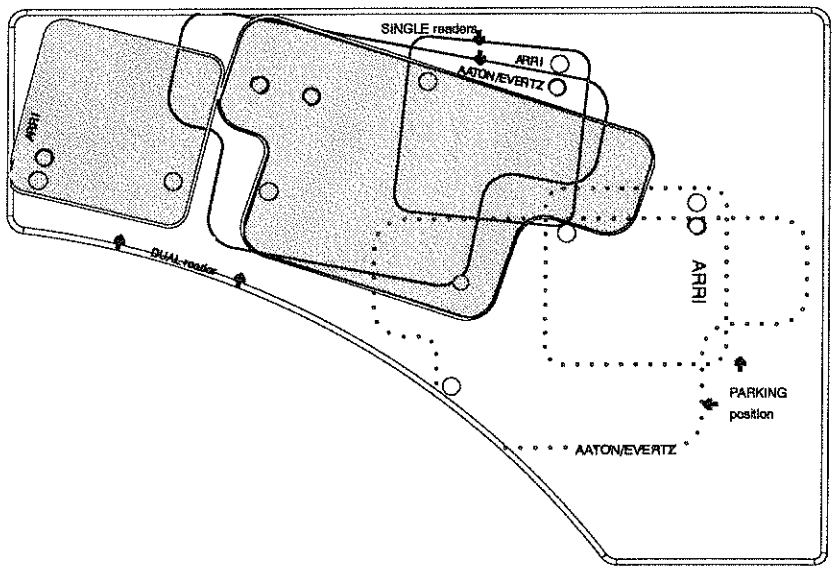


Fig. 441: Dual reader positions

4.10.8.1 Mounting dual Keycode Readers ARRI and AAton

1. Put both keycode readers on their positions as dual readers and fasten them with the knurled screws (1), Fig. 442.

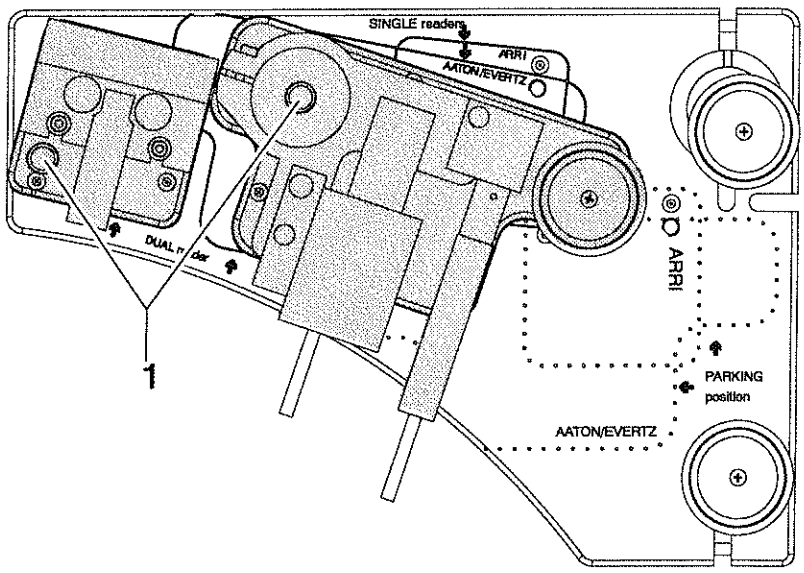


Fig. 442: ARRI and AATON readers in film run

2. Check the film run

Note! **See AATON manual for fine adjustment of the keycode reader head!**

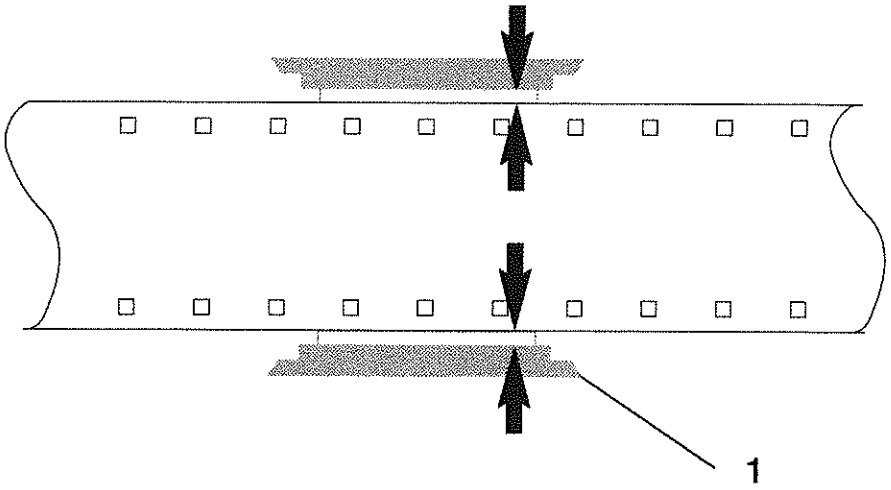


Fig. 443: Film run adjustment

Make sure that the film edges **do not touch the edges** of the guide roller (1).

4.10.8.2 Mounting dual Keycode Readers ARRI and EVERTZ

1. Put both keycode readers on their positions as dual readers and fasten them with the knurled screws (1) (Fig. 444).
2. Check film run as above.

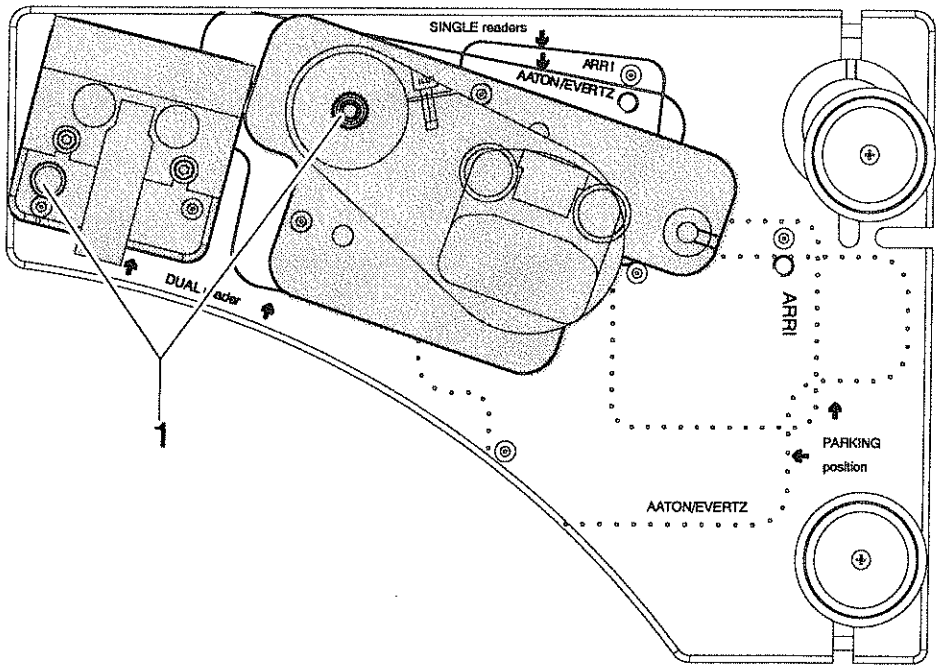


Fig. 444: ARRI and EVERTZ readers in film run

Note! **See EVERTZ customer's manual for fine adjustment of the keycode reader head!**

4.10.9 USAGE OF THE PARKING POSITION IN CASE OF TWO READERS

Fig. 445 shows the mounting positions of the keycode readers when being used in combination of park and read position.

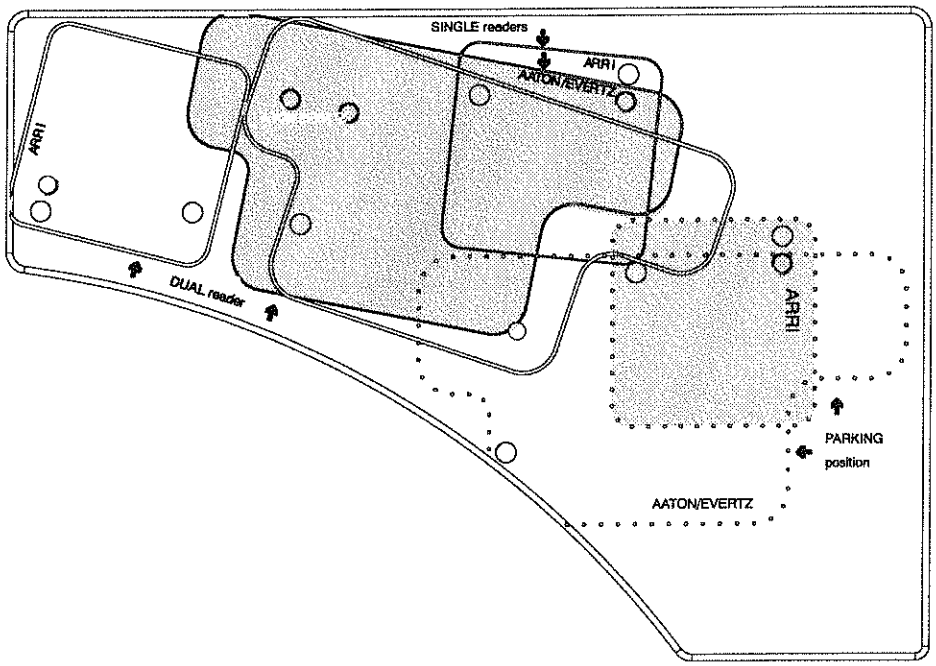


Fig. 445: Possible ARRI reader parking position when using two readers

4.10.10 PARKING POSITION OF ARRI (ONLY POSSIBLE IN COMBINATION WITH EVERTZ READER)

Put the ARRI reader (1) on the parking position and fasten it with the knurled screw. Set the EVERTZ reader to single position and fasten it also with the knurled screw.

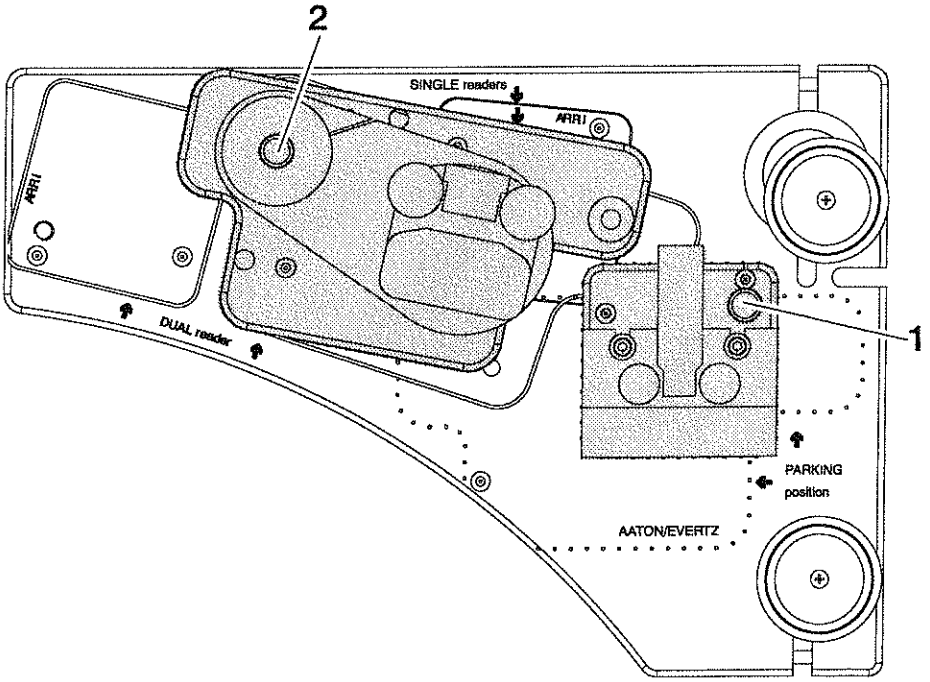


Fig. 446: ARRI reader in parking position and Evertz reader in film run

4.10.11 ARRESTING THE SWING ARM OF THE DAMPING ROLLER

Note!

If, under certain operational conditions (e.g. film splices) counting errors are occurring with the keycode reader, the motion of the damping roller (1) can be inhibited afterwards by arresting of its swing arm with the clamping ring (2).

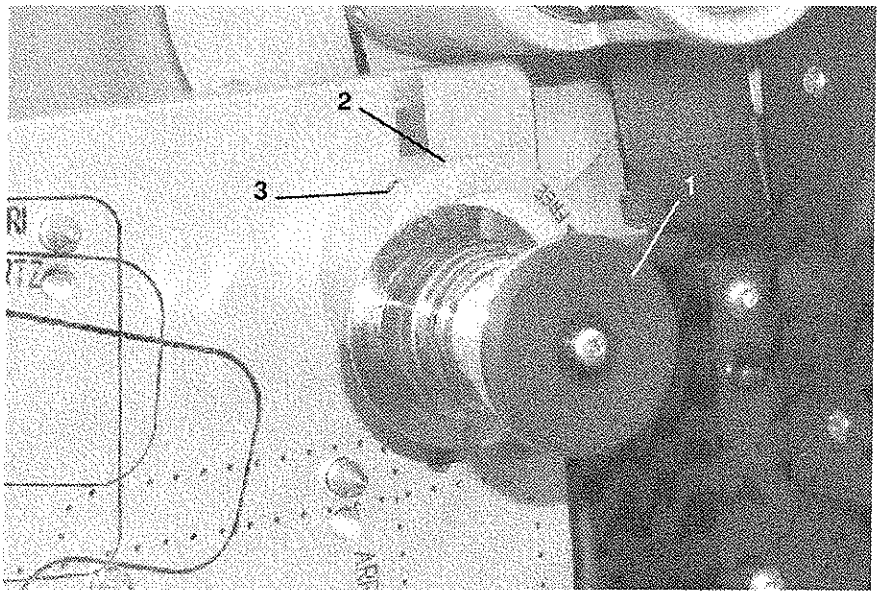


Fig. 447: Arresting the swing arm of the damping roller

For this purpose, the swing arm (damping roller) is turned to its upper end stop by loosening the grub screw (3) and rotating the clamping ring (2) in clockwise direction, position FIXED.

For securing the clamping ring in the new position, tighten the grub screw (3) again with a 2mm Allan key.

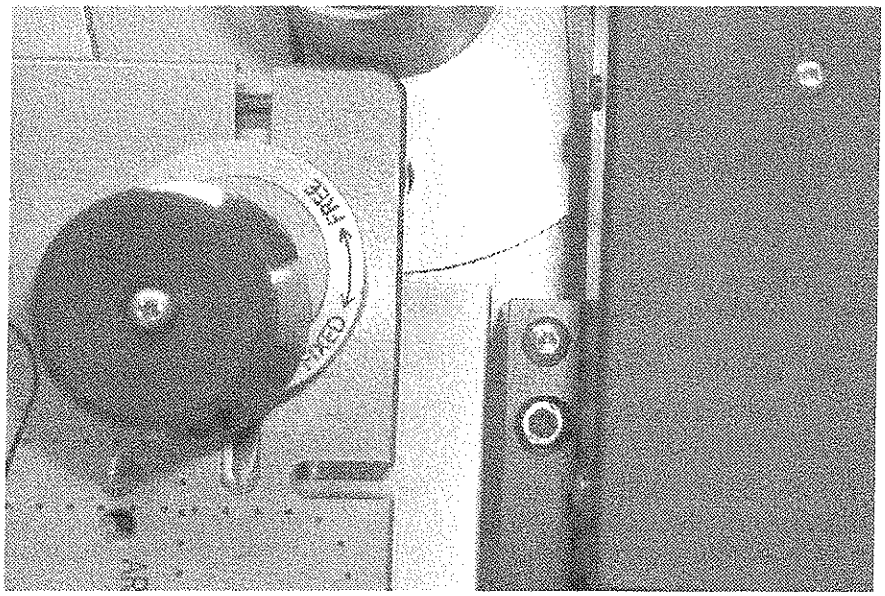


Fig. 448: Damping roller with damping ring

4.10.12 CABLING THE KEYCODE READERS

Attention!

Prior to laying the keycode reader cables they have to be wrapped with shield wrap mesh according to section 4.10.13!

The cables of the keycode readers can be laid between the base plate (1) and the film deck. Subsequently they are fed through the cable feed-through (2) and through the Spirit DataCine film scanner to the EMC Terminal Panel, see Fig. 451. For this purpose, fasten the reader cables with Phillips screw M3 and fixing plate and cable tie to the bores (3) of the base plate.

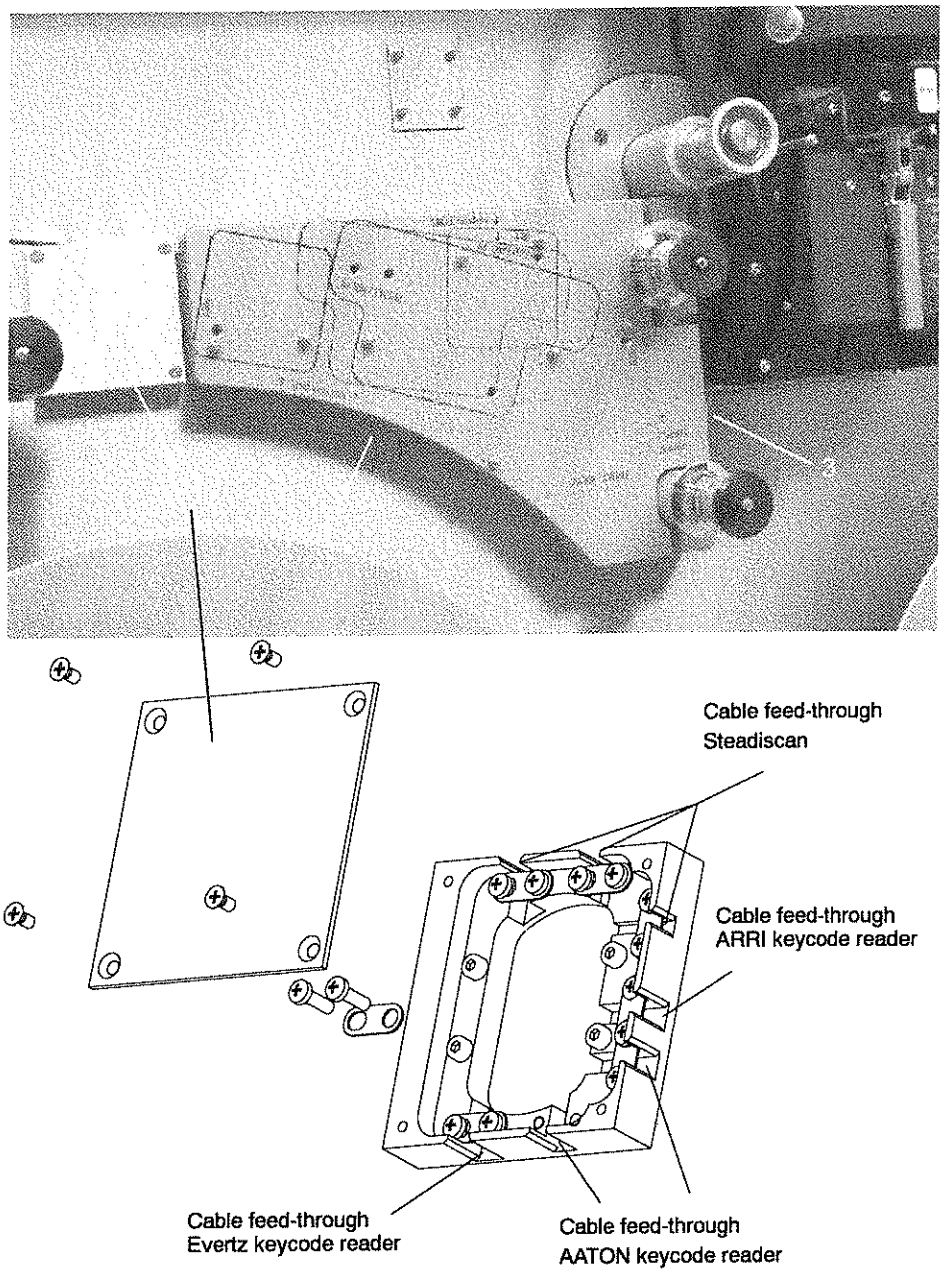


Fig. 449: Cabling feed-through in the filmdeck

Feed the reader cable through the film scanner SDC 2002 and fasten it. Ground the shielding at the feed-through terminal and lead it out there.

4.10.13 EMV / EMC REQUIREMENTS

To avoid EMV / EMC problems, all reader cables have to be wrapped with knitted wire mesh from the cable feed-through in the film deck up to the connection terminal at the SDC 2002. Earth contact has to be made at the cable feed-through (film deck) and at the connection terminal (rear of SDC 2002).

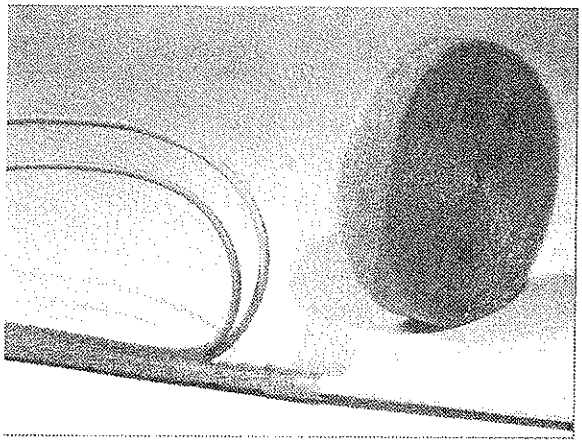


Fig. 450: Wrapping with knitted wire mesh shield

Fix the knitted wire mesh shield at beginning and end of the reader cable with a cable tie.

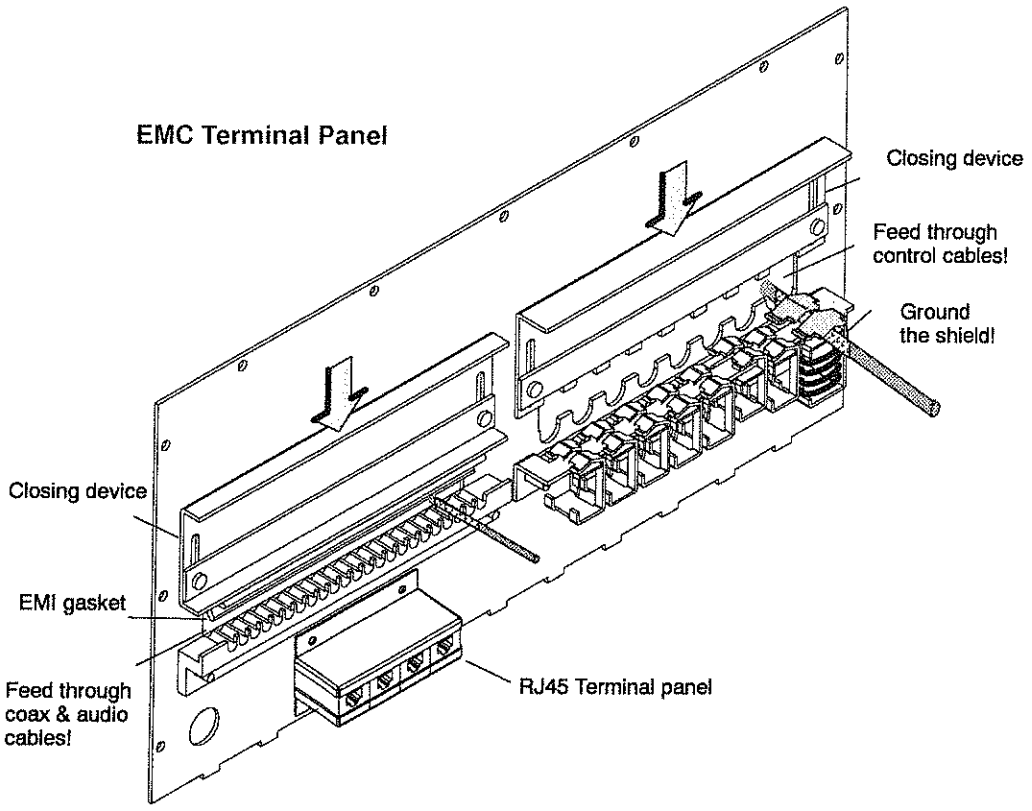


Fig. 451: Rear view of the EMC Terminal Panel

4.10.14 INTERCABLING OF THE KEYCODE READER SYSTEM

Details of intercabling, see chapter 3.14. up to chapter 3.16.

4.11 CONNECTING AN EXTERNAL GATEBLAST AIR COMPRESSOR

Gateblast unit

An integrated gateblast unit, consisting of a pressure reducer, 3 µm air filter and magnetic valve, keeps the light gap and the integration cylinder of the film gate dustfree.

An external air compressor with the following features

- 2.5 - 7.5 bar = 35 - 100 lb /sq. inch
- Pre-filtered air (max 40 µm)
- Less than 80 % relative air humidity
- Oil-free

and a high pressure hose is additionally required.

Connect an external air compressor as follows:

- Connect a1/4 inch (8 mm) air hose to the appropriate air connector (1) (figure 452) at the cabinet rear bottom left-hand side.

Attention!

Use only high-pressure hose > 7.5 bar = 110 lb /sq. inch.

- Secure air hose with a circular clip on the connector (1) figure 452

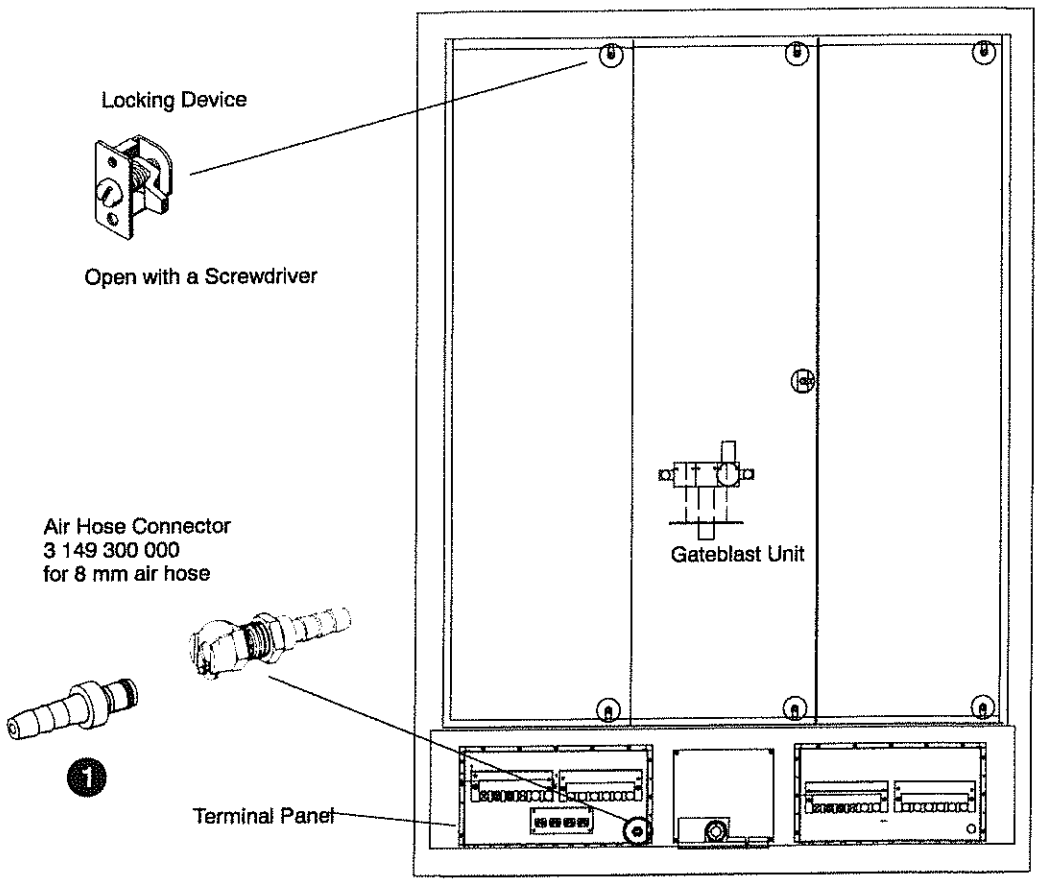
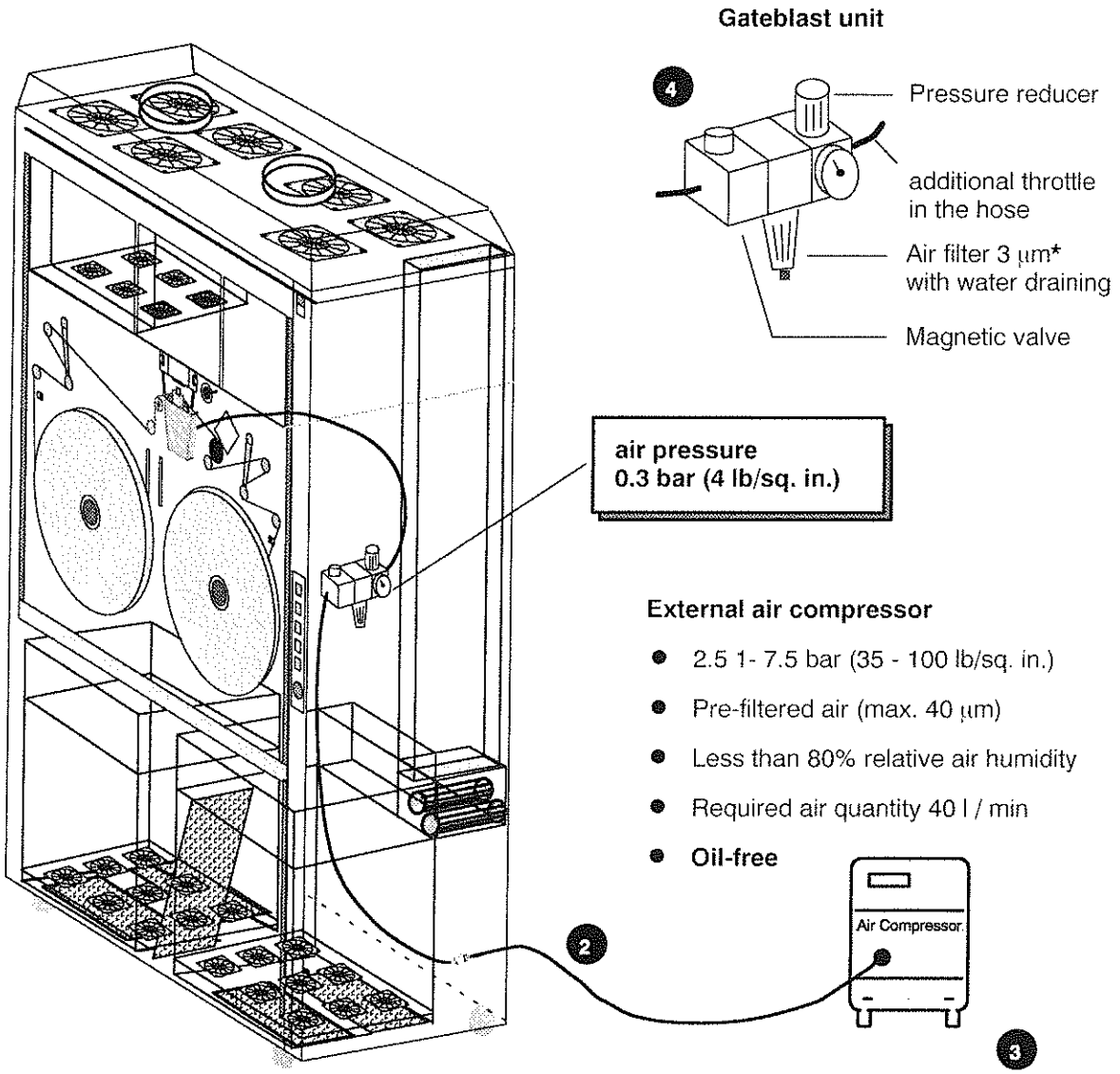


Fig. 452: Rear side of the film scanner with air connector terminal panel

- Adapt air hose 2 to the air compressor 3 (figure 453)



* Air filter is included in the Filter & Battery Set 2 128 102 112

Fig. 453: Gateblast unit of the film scanner

- Check the correct air pressure **0.3 bar** or 4 lb / sq. inch (nominal value with throttle in the air hose)
  of the pressure reducer 4 (figure 453) when the film scanner is in PLAY mode.
  Correct it if necessary.

If the film scanner is in STOP, switched off, or when mains failure occurs, the magnetic valve of the gateblast unit switches off the air supply.

The required air quantity amounts to 40 l / min.

4.12 MAINS VOLTAGE CONNECTION GENERAL

1-Phase Power Terminal Unit 230V/50Hz FH 1032 (not Ul approved)
2-Phase Power Terminal Unit 208V/60Hz FH 1033 (UL approved)
3-Phase Power Terminal Unit 120V/208V/60Hz/398V/50Hz FH 6030 (UL appr.)

Safety Instructions!

Mains installation **must** only be done by qualified personnel!

Power supply in excess of 40 volts are potentially hazards or lethal.

Supplies of up to 25 kV (Ignition Xenon Lamp) exist within the film scanner.

At no time should contact be made with the machine wiring or terminals, except via a probe with appropriate insulating properties.

Opening covers or removing assemblies except for those which can be actuated by hand (without using tools) may give access to live components or parts. Therefore, disconnect the film scanner from the AC power before beginning any repair works or before exchanging any parts.

CAUTION !

Disconnect power cord
before removing covers!
Parts of this unit are still alive in
"OFF"-condition!

No operator serviceable parts inside. Refer servicing to qualified personnel!

Capacitors may still carry a residual charge!

In cases it is unavoidable to carry out repair works on the film scanner while it is powered, this should be done only by qualified personnel being informed about the dangers involved, and only after having taken the necessary preventive measures.

If it can be taken for granted that due to a damage, safe operation of the film scanner is no longer possible, put the unit out of operation and make sure that it cannot be switched on again.

Plug-in units

For safety reasons, all plug-in units should only be operated in the built-in condition.

4.12.1 GENERAL REMARKS CONCERNING COMMISSIONING AND AC POWER SUPPLY

The film scanner and is designed in conformity with the VDE safety regulations EN 60950 (VDE 0805), protection class 1 and UL 1419 and is in unobjectionable condition when leaving the factory.

In order to maintain this condition and to ensure safe operation, the following directions have to be observed:

Mains voltage check

The film scanner is delivered for operation on the required mains voltage. This voltage is marked on the type label at the rear of the cabinet and should be checked against the actual studio mains voltage before switching on the equipment.

THOMSON BROADCAST SOLUTIONS — Made in Germany

TYPE	SDC 2001
PART/SER.NO	0 128 530 000 / 2101
STANDARD	1125 / 1250 / 525 / 625
POWER AC	3W +N+ PE / 120/208 V / 19A, 17A, 12A
	2W + PE / - /208 V / 25A
FREQUENCY	47 - 63 Hz

CE UL Listed Professional Video Equipment 3 S 13 c UL

Fig. 454: Type label for SDC 2002 - 120V / 208V / 60Hz version

THOMSON BROADCAST SOLUTIONS — Made in Germany

TYPE	SDC 2001		
PART/SER.NO	0 128 530 000 / 2101		
STANDARD	1125 / 1250 / 525 / 625		
POWER AC	3W+N+PE	230/400 V: 10A, 9A, 6A	X
		120/208 V:19A, 17, 12A	
	2W + PE	- /208 V: 25A	
	1W+N+PE	- /200 V: 26A	
		- /230 V: 23A	
		- /240 V: 22A	
FREQUENCY	47 - 63 Hz		

Fig. 455: Type label for SDC 2002 - 230V / 400V 50Hz - version

3-phase mains connection

3 * 400V, 50Hz, three-phase current, 230V mains
3 * 208V, 60Hz, three-phase current, 120V mains
Class 1 wiring applicable

2-phase mains connection

2 * 208V, 60Hz, two-phase current, 120V mains
Class 1 wiring applicable

1-phase mains connection

1 * 230V, 50Hz, one-phase current, 230V mains

Power consumption

approx. 5.4kVA

Earthing

wiring regulations according to VDE 0800/part 2,
VDE 100/part 540,
IEC 364-5-54, IEC 364-4-41, NEC Code ANSI/NFPA
or the applicable national regulations.

Fuses

When changing fuses, it is mandatory to use only UL-fuse links of same type and current rating as a replacement. Using mended fuses or shorting the fuse holder is not permissible.

Mains voltage change

When connecting this film scanner to another mains voltage, the fuses in the subunits have to be checked or exchanged. For details see chapter 4.18.

Opening covers or removing assemblies except for those which can be actuated by hand (without using tools) may give access to live components or parts. Therefore, disconnect the film scanner from the AC power before beginning any repair works or before exchanging any parts.

Ventilation

For ventilating the film scanner cabinet, four blower units are mounted in different plane surfaces.
When installing the film scanner, care should be taken to allow for adequate aircirculation.
In addition, several subunits are equipped with their own blowers.
For the blowers no change of the supply voltage has to be executed.

4.12.2 LOCATION OF POWER TERMINAL UNIT

- 3-PHASE FH 6030 (UL approved for 120V/208V 60Hz)
  or
- 2-PHASE FH 1033 (UL approved for 208V/60Hz)
  or
- 1-PHASE FH 1032,(not UL approved)

Line Filter and Central Earth Screw

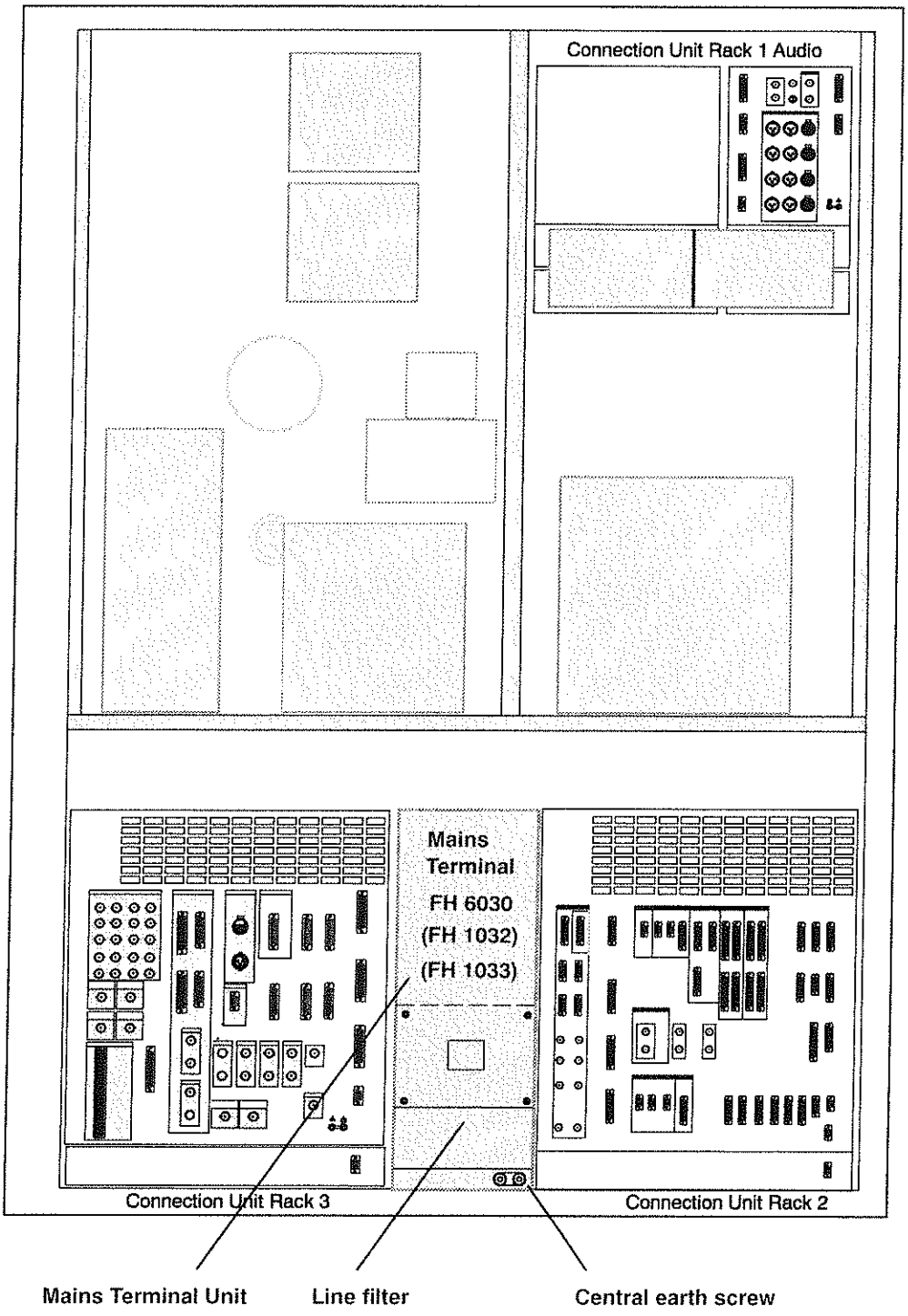
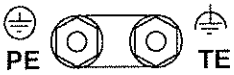


Fig. 456: **Film scanner**, rear view

4.13 EARTHING REQUIREMENTS



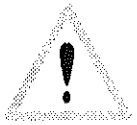
Earthing instructions:

1. Earthing with the protective earth has to be executed with the power cord which contains the earthed protective conductor **PE** (normally).
   The earth conductor has to be connected to the **PE** screw terminal within the line filter!
2. The additional protective earth has to be connected to the central **PE** screw at the power terminal unit as earth conductor with large cross section!
3. The jumper **TE -- PE** must not be broken!
4. The earth connection has to be made **before** connecting the power cord!

CAUTION! GROUNDING CIRCUIT CONTINUITY IS VITAL FOR SAVE OPERATION OF MACHINE. NEVER OPERATE MACHINE WITH GROUNDING CONDUCTOR DISCONNECTED

ATTENTION! UN CIRCUIT DE TERRE CONTINU EST ESSENTIEL EN VUE DU FONCTIONNEMENT SECURITAIRE DE L'APPAREIL. NE JAMAIS METRE L'APPAREIL EN MARCHE LORSQUE LE CONDUCTEUR DE MISE A LA TERRE EST DEBRANCHE

Protective earthing



Earthing of the film scanner serves the product safety and meets the requirements in conformity with safety class I.
The film scanner is connected with the protective earth of the power supply circuit (e.g. the studio) by means of the power cord which also contains the earthed protective conductor **PE** (see also chapters 4.16 "Required cross sections for the power cords" and 4.17 "Installation of the power cord").
Precondition is an earthed and checked mains connection!
The protective earth conductor of the power cord **always** has to be connected to the **PE** screw terminal within the line filter. This **PE** screw terminal is internally connected with the parts to be earthed, e.g. the cases.
The effect of the protective earth connection must not be cancelled through the use of an extension cord without protective earth conductor, through an excessively long cable, nor must its function be disabled in any other way!

High leakage current

Due to its high leakage current (> 3.5mA), the film scanner **must** be connected with an additional earth conductor of 6mm^2.

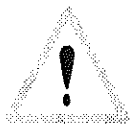
Additional Earth Conductor UL 1419

An insulated earthing conductor that is identical in size, insulation material, and thickness to the earthed and unearthed branch circuit supply conductors except that it is green with or without one or more yellow stripes, is to be installed as part of the branch circuit that supplies the unit or system.

(For more details see chapter "Required cross sections for the mains / earth cables").

Make the earth connection with the additional earth conductor to the central **PE** screw at the power terminal unit always **before** applying mains power!

For this purpose, the line filter also carries the following warning note:



CAUTION !
HIGH LEAKAGE CURRENT
Earth connection mandatory
before connecting mains supply

Connecting to Service Equipment UL 1419

The earthing conductor described is to be connected to earth at the service equipment or, if supplied by a separately derived system, at the supply transformer or motor generator set.

Earthed Plug Receptacles UL 1419

The attachment-plug receptacles in the vicinity of the device or system have all to be of an earthing type, and the earthing conductors serving these receptacles are to be connected to earth at the service equipment.

The film scanner is provided with two separate terminals for connecting protective earth **PE** and technical earth **TE** (e.g. video earth) at the power terminal unit.
On delivery, these terminals are joined by a short-circuit jumper.
The jumper **TE -- PE** must not be broken!

For using the **TE** terminal it is necessary to consult Thomson.

The **PE** terminal, marked by the symbol ⏚ 417-IEC-5017 (protective earth), is internally connected with the **PE** terminal of the line filter and the metal case parts.

TN-C power systems

In case of TN-C power systems (combination of neutral conductor and protective conductor), it is necessary to observe the regulations in conformity with IEC 364-5-54 (VDE 0100 T.540) and IEC 364-4-41, IEC 364-4-47 (VDE 0100 T.410) or the applicable national regulations.

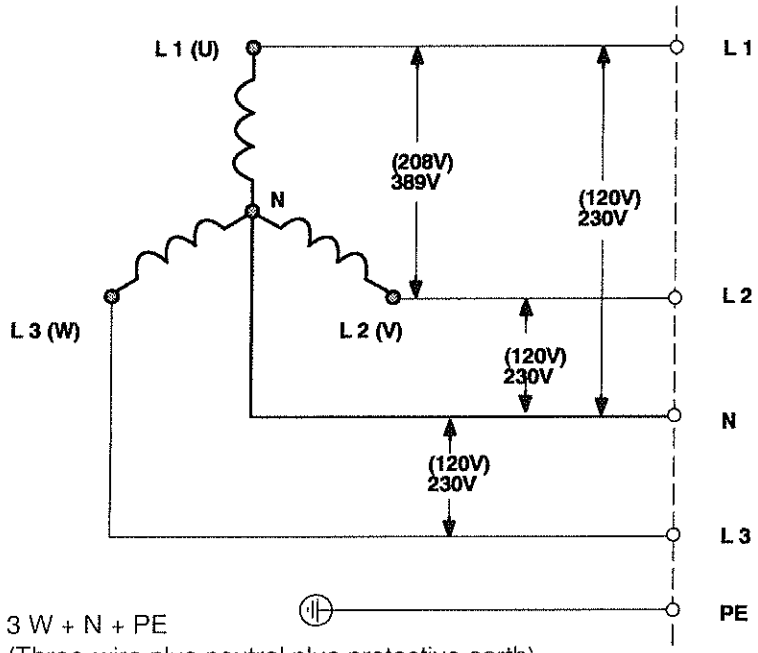
Any break of the protective earth conductor inside or outside the film scanner or disconnection of the protective conductor connector may entail that, in the event of a failure, the operational safety of the device will no longer be ensured!
All mains sockets of devices being interconnected with signal cables have to be checked. The protective earth conductors must not be live!

Abbreviations: (In conformity with DIN 42 400 or IEC Publication 445)

FPE	=	functional protective earth
L	=	line, outer conductor (phase, R, S, T)
N	=	neutral conductor
PE	=	protective earth conductor (earlier designation: PROTECT GND) color code of the PE wire: green/yellow
TE	=	technical earth = functional noiseless earth (video earth, audio earth with protective earth qualities color code of the TE wire: black
IEC	=	International Electrotechnical Commission
VDE	=	Association of German electrical technicians and electrical engineers
DIN	=	German industrial standards

4.14 MAINS VOLTAGE SYSTEMS (POWER TYPES)

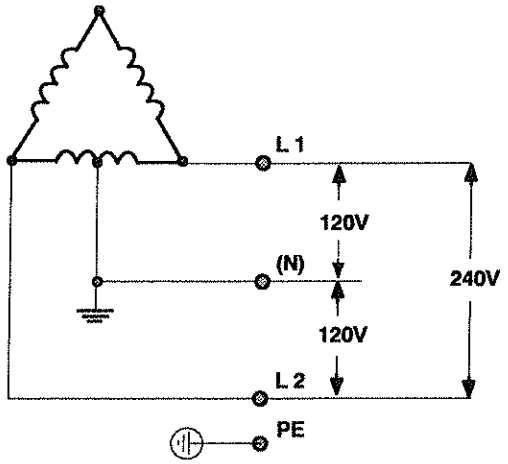
4.14.1 MAINS SYSTEM FROM EUROPE AND USA IN BRACKETS (THREE-PHASE CURRENT, Y OR STAR CONNECTION)



3 W + N + PE
(Three-wire plus neutral plus protective earth)

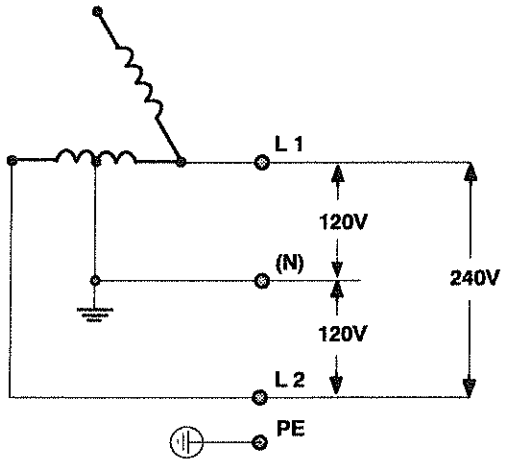
4.14.2 MAINS SYSTEM FROM USA AND (SOUTH-EAST) ASIA, JAPAN

4.14.2.1 Three-phase current, delta connection



Three-phase current, delta connection, four-wire, earthed midpoint of phase;
= two-phase connection 240Vac; N is not connected to the film scanner

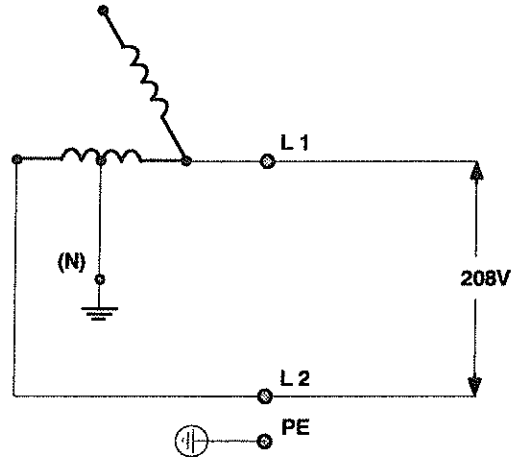
4.14.2.2 Three-phase current, open delta connection



Three-phase current, open delta connection, four-wire, earthed midpoint of phase;
= two-phase connection 240V (200V); N is not connected to the film scanner

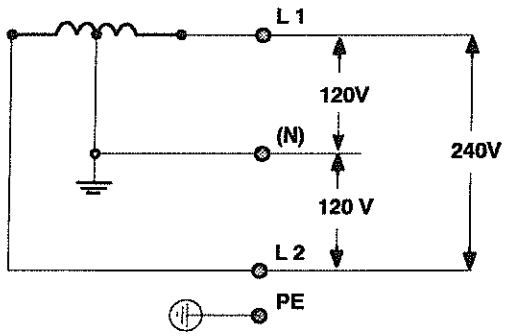
4.14.2.3 Two-phase current

Two-phase current, two wire, earthed midpoint;
N (Neutral) is not connected to the film scanner.



2W +PE
(Two wires plus protecive earth)

4.14.2.4 Single-phase (two-phase) current



Single-phase (two-phase) current, three-wire, earthed midpoint;
N is not connected to the film scanner

4.15 AN EASY WAY TO FIND OUT THE TYPE OF POWER SYSTEM

When you need to determine the type of power you have in a plant, use the following simple procedure:

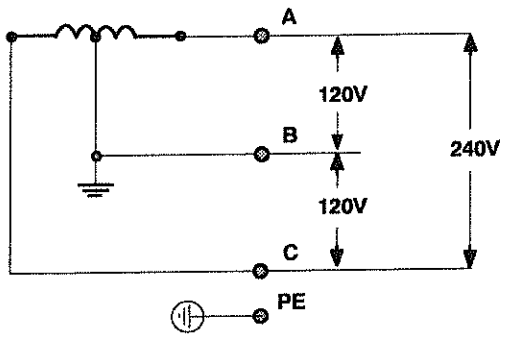
1. Label each wire with an identification tag, i.e. A, B, C, etc. This is especially helpful when all wires are of the same color.
2. Jot down the total number of combinations you can derive from the wires you have, e.g.:
   3 wires will have 3 combinations,
   4 wires will have 6 combinations,
   5 wires will have 10 combinations.

Example:
4 wires labeled A, B, C, D equals 6 possible combinations:
A to B, A to C, A to D,
B to C, B to D,
C to D.

3. Using your multimeter, measure the voltages between all the wire combinations. Note the voltages.
4. The lower voltages are the mains voltages whereas the higher voltages are the phase voltages. This procedure can be used for any power system, regardless whether it is an Edison, a wye (star), delta (mesh) or a crazy leg delta.

Let's apply this procedure to get a better understanding of the three basic power systems.

4.15.1 EDISON SYSTEM, 120/240VAC, SINGLE-PHASE, 3-WIRE

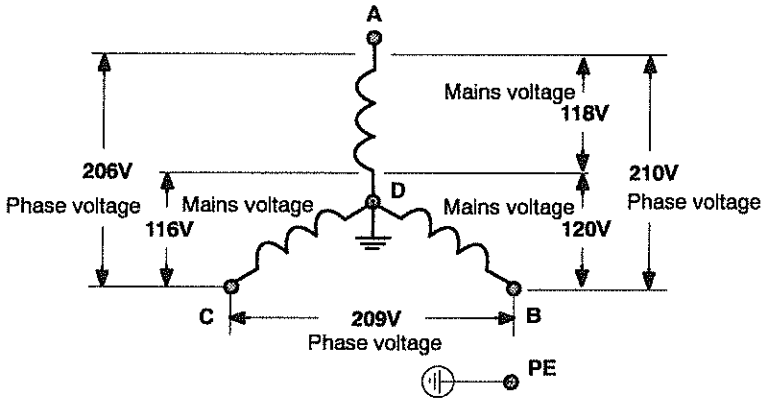


Single-phase (two-phase) current, three-wire, earthed midpoint

There are 3 wires, therefore there are 3 combinations.
Example:

A to B = 120Vac mains voltage,
A to C = 240Vac phase voltage,
B to C = 120Vac mains voltage.

4.15.2 WYE (STAR) SYSTEM, 120/208VAC OR 230/398VAC, THREE-PHASE, 4-WIRE



Three-phase current, star connection, four-wire, earthed neutral

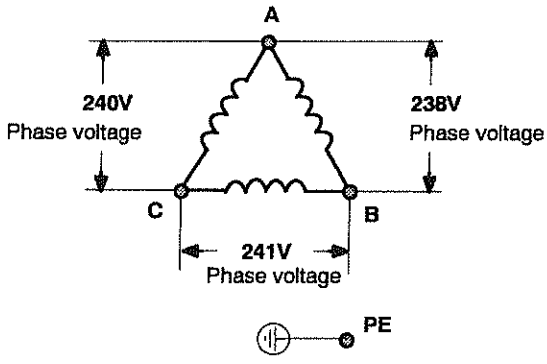
There are 4 wires, therefore there are 6 combinations.
Example:

A to B = 210Vac,	B to C = 209Vac,
A to C = 206Vac,	B to D = 120Vac,
A to D = 118Vac,	C to D = 116Vac.

The illustration shows the symmetry of the configuration. The characteristics of this system are:

- the phase voltages A to B, B to C and A to C are all within ±10% of each other,
- the mains voltages A to D, B to D and C to D are all within ±10% of each other,
- the phase voltage is 1.73 times the mains voltage,
- the loads in the system account for the slight differences among the mains voltages and the phase voltages

4.15.3 DELTA (MESH) SYSTEM, 240VAC OR 398VAC, THREE-PHASE, 3-WIRE



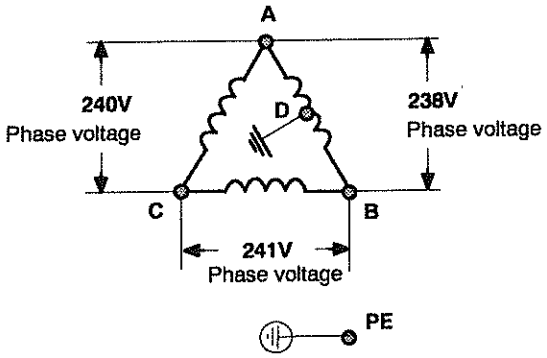
Three-phase current, delta connection, 3-wire, 240Vac or 398Vac;

There are 3 wires, therefore there are 4 combinations.
Example:

A to B = 238Vac,
A to C = 240Vac,
B to C = 241Vac.

The characteristics of the delta system are:
- there is no neutral so there are no mains voltages,
- the phase voltages A to B, A to C and B to C are within ±10% of each other.

4.15.4 WILD LEG (CRAZY LEG) DELTA SYSTEM, 120/240VAC, THREE-PHASE, 4-WIRE



Three-phase current, wild leg delta connection, 4-wire,
120/240Vac, earthed midpoint of phase;

There are 4 wires, therefore there are 6 combinations.
Example:

A to B = 238Vac,	B to C = 240Vac,
A to C = 240Vac,	B to D = 119Vac,
A to D = 119Vac,	C to D = 208Vac.

Occasionally, you will find a delta system in which one phase is center tapped and grounded. This is called a wild leg delta. It produces two mains voltages which are each equal to half of the phase voltage.

Example:
A to D = 120Vac mains voltage,
A to C = 120Vac mains voltage,
A to B = 240Vac phase voltage.

The voltage between C and D in the wild leg delta system is usually not within the specifications for our equipment. Use the following formula to determine the C or D voltage:

Phase voltage divided by 2, multiplied with 1.73

In our example:

240Vac : 2 * 1.73 = 208Vac

This voltage can vary significantly if the phase voltage is less than 240Vac or if there are unbalanced loads on the delta system.

If the equipment which you are installing requires three-phase power, the customer must correct the system before the equipment can operate.
If the equipment requires only single-phase power, you can install the equipment but be sure to use one of the wires with the correct voltage.

4.16 REQUIRED EXTERNAL CIRCUIT BREAKER & CROSS SECTIONS FOR THE MAINS / EARTH CABLES

	Mains System	Cross Section	Cable Type	Circuit Breaker Wall Outlet
Europe	3 Ph+N+PE or 2Ph+PE 230/400V	5 x 6mm²	H07RNF5G6.0	223-32K ABB-Stotz
	1Ph+N+PE 230V	3 x 6 mm²	H07RNF3G6.0	222-32K ABB-Stotz
USA	3 Ph+N+PE 120/208V	AWG 10/5x	SO 600V	223-32K ABB-Stotz *
	2Ph + PE 208V	AWG 8/3x	SO 600V	222-32K ABB-Stotz
Japan	3 Ph+N+PE 100/200V	AWG 10/5x	SO 600V	223-32K AB-Stotz *
	2Ph + PE 200V	AWG 8/3x	SO 600V	222-32K ABB-Stotz

*see NEC Code 1993 240-4 Exception No.1

Manufacturer for circuit breaker:

ABB-Stotz-Kontakt GmbH
D-69123 Heidelberg
Eppelheimer Str. 82
Tel: 06221 / 701 748

Note for Japan!
3-phase current 3 x 175V, 60 Hz not supported.
Use 3-phase current 3 x 350 V, 60 Hz!

4.17 INSTALLATION OF THE POWER CORD

4.17.1 THREE-PHASE POWER TERMINAL UNIT (FH 6030) (120V/208V VERSION UL APPROVED)

Three-phase voltage has to be connected via a power cord to the line filter in the power terminal unit (FH 6030) from the rear of the film scanner cabinet:

Remove the lower case at the rear side of the power terminal unit (4 hex screws).
Open the cover plate of the line filter (6 screws).
Pass the insulated power cord, provided with multicore cable ends, through the cable tube of the cabinet and of the line filter.

Terminate the cable ends at the input connecting block of the line filter as follows:

Protective earth	**PE**	to	⏚ **PE**(IN)
(**PE** has to be terminated at first!)			
Neutral	**N**	to	**N** (IN)
Phase	**L1** (**U**)	to	**L1** (IN)
Phase	**L2** (**V**)	to	**L2** (IN)
Phase	**L3** (**W**)	to	**L3** (IN)

(The arrangement of the phases is optional)

Fasten the strain relief of the cable tube and reinstall the cover plate of the line filter and the housing of the power terminal unit.

For more details see circuit diagram 1-12860-30-SP (FH 6030)

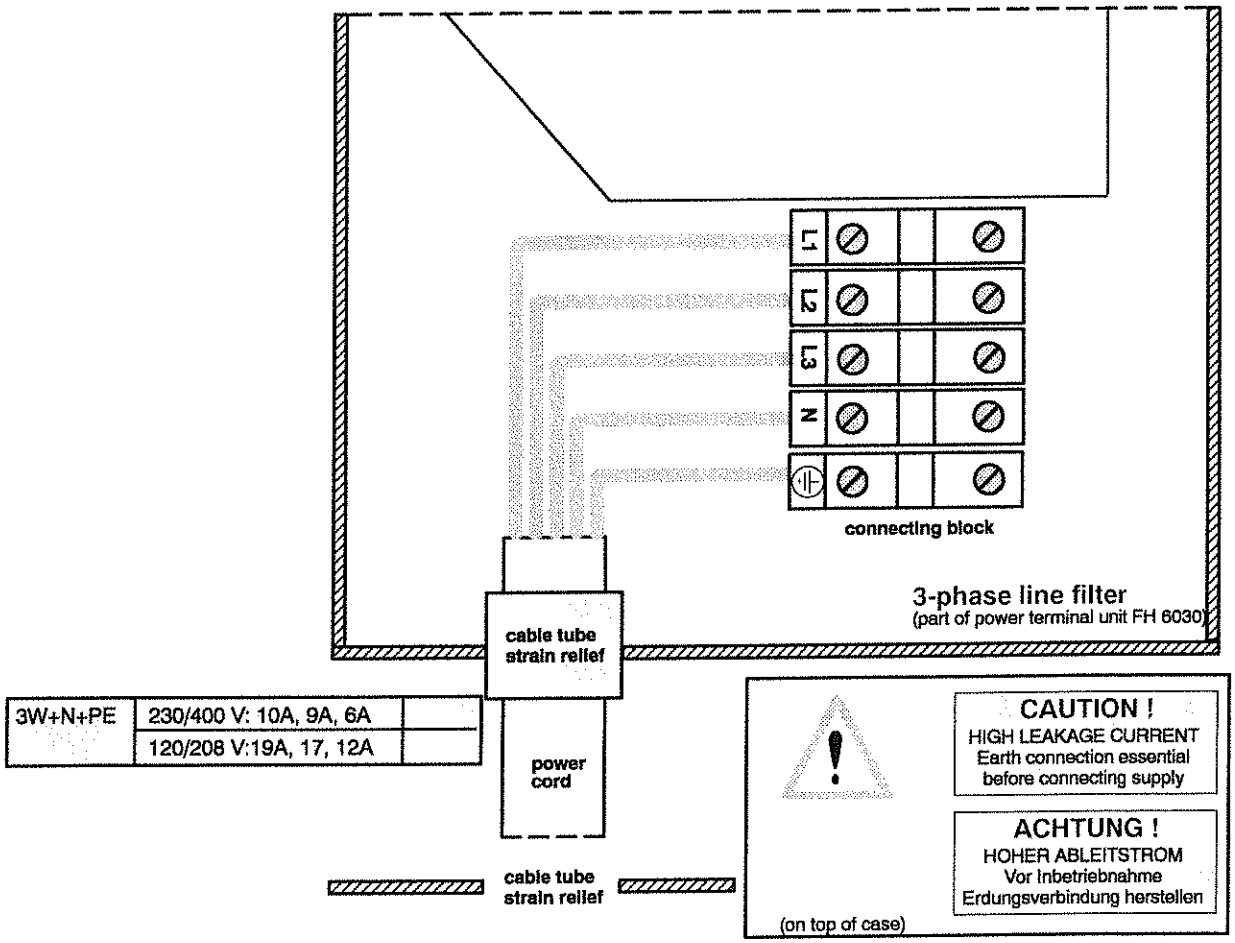


Fig. 457: **3-phase line filter**, with removed cover plate (FH 6030), top view

4.17.2 TWO-PHASE POWER TERMINAL UNIT 1033, OPTION (UL APPROVED)

The **phase-to-phase voltage must have** a value of about **208V!**

120V-Mains operation is not possible!

Two-phase voltage has to be connected via a power cord to the line filter within the power terminal unit (FH 1033) from the rear of the film scanner cabinet:

Remove the cover plate of the connecting block (4 screws).

Terminate the cable ends at the input connecting block of the line filter as follows:

Protective earth (**PE** has to be terminated at first!)	**PE**	to	**PE IN**
Phase	**L1**	to	**L1 IN**
Phase	**L2**	to	**L2 IN**

Fasten the strain relief and the cover plate of the connecting block.

For more details see circuit diagram 1-12810-32-SP (FH 1053 / 1033))

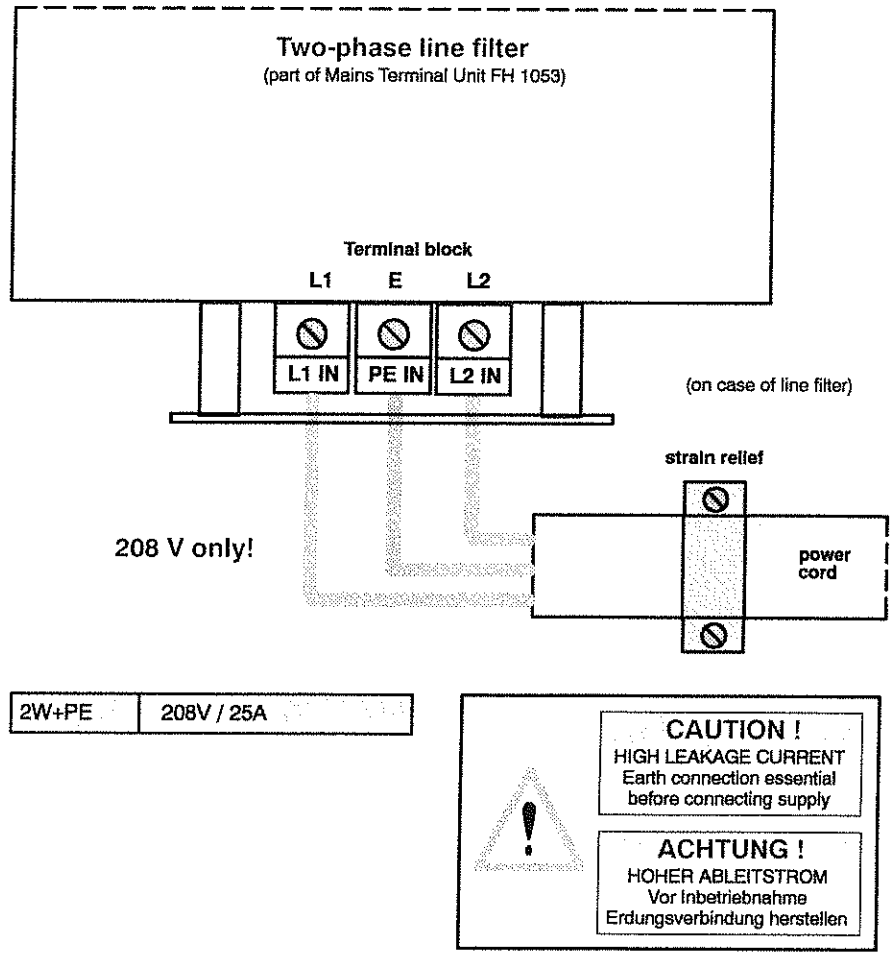


Fig. 458: **Two-phase line filter set** (FH 1033), top view

4.17.3 SINGLE-PHASE POWER TERMINAL UNIT FH 1032, OPTION (NOT UL APPROVED)

The **phase-to-neutral voltage must have** a value of about **230V.**

Single-phase voltage has to be connected via a power cord to the line filter within the power terminal unit (FH 1032) from the rear of the film scanner cabinet:

Remove the cover plate of the connecting block (4 screws).

Terminate the cable ends at the input connecting block of the line filter as follows:

Protective earth (**PE** has to be terminated at first!)	**PE**	to	**PE IN**
Phase	**L1**	to	**L1 IN**
Neutral	**N**	to	**L2 IN**

Fasten the strain relief and the cover plate of the connecting block.

For more details see circuit diagram 1-12810-32-SP (FH 1032)

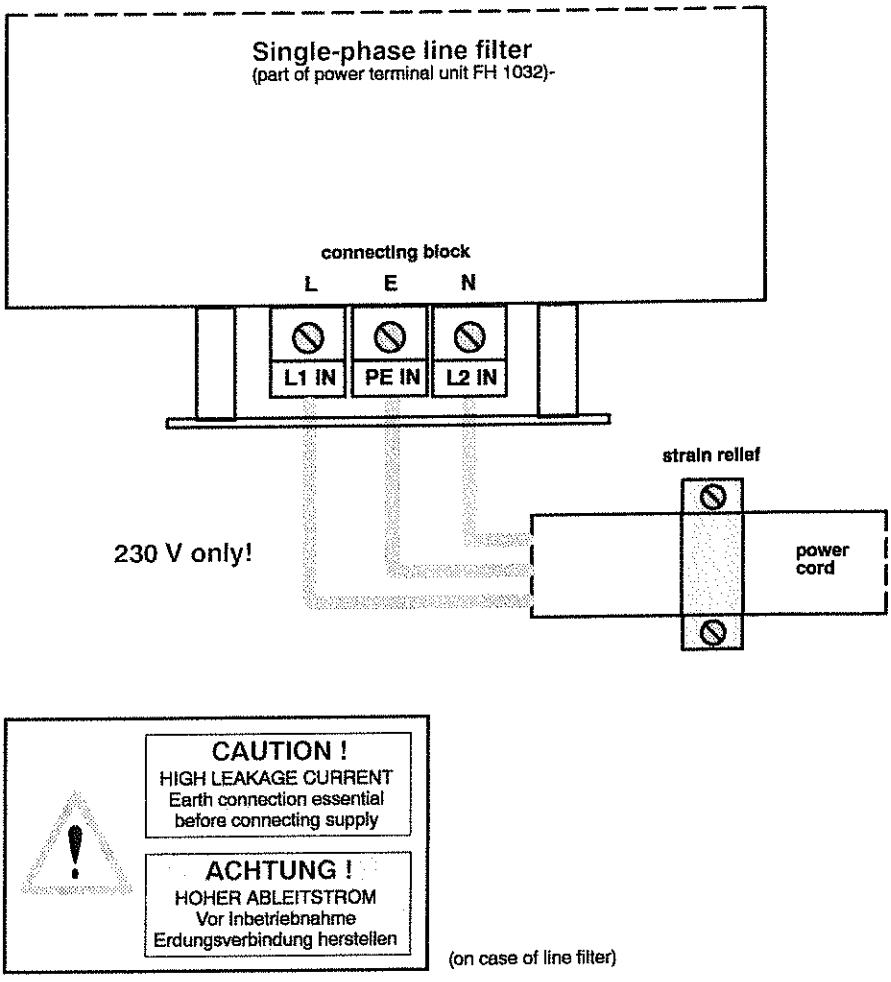


Fig. 459: **Single-phase line filter** (FH 1032), top view

4.18 FUSES FOR SUBUNITS IN THE POWER TERMINAL UNITS

4.18.1 POWER TERMINAL UNIT 3-PHASE FH 6030 (120/208V - 230/400V not UL approved)

The mains fuses set FH 1061 (120/208V) or FH 1062 (230/400V, not UL approved) for the subunits is contained in the power terminal unit FH 6030. The dimensions of the fuses are 5 * 20mm(FH1062) or 6.3 * 32mm (FH1061).

The current ratings are written on the mounting plate beside the fuse holders for 120V and 230V as shown below:

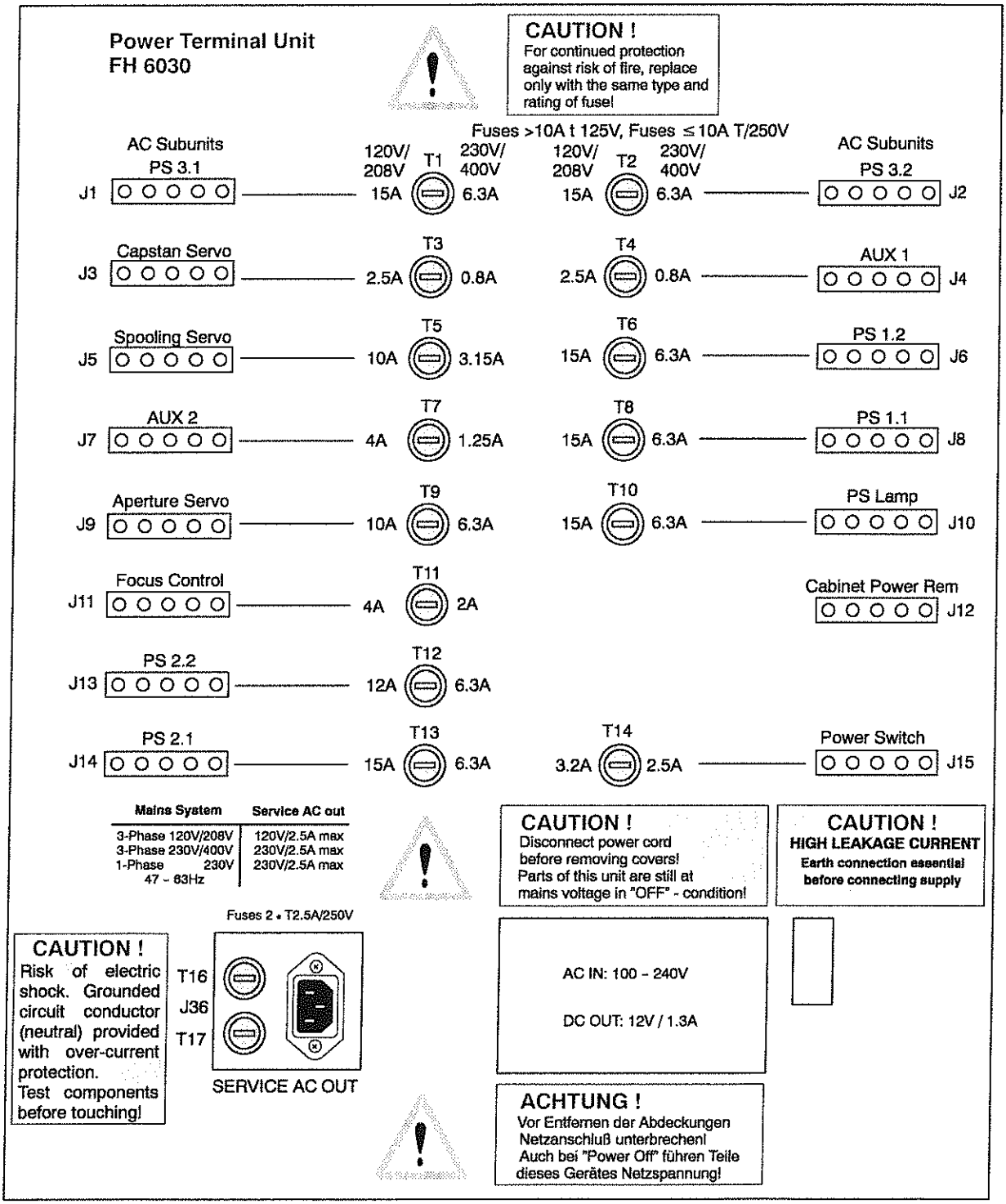


Fig. 460: **Power terminal unit FH 6030**

4.18.2 POWER TERMINAL UNIT 2-PHASE FH 1033 (208V UL VERSION)

The mains fuses set FH 1073 for the subunits is contained in the power terminal unit FH 1033. The dimensions of the fuses are 6.3 × 32mm.
The current ratings are written on the mounting plate beside the fuse holders for 120V/208V as shown below:

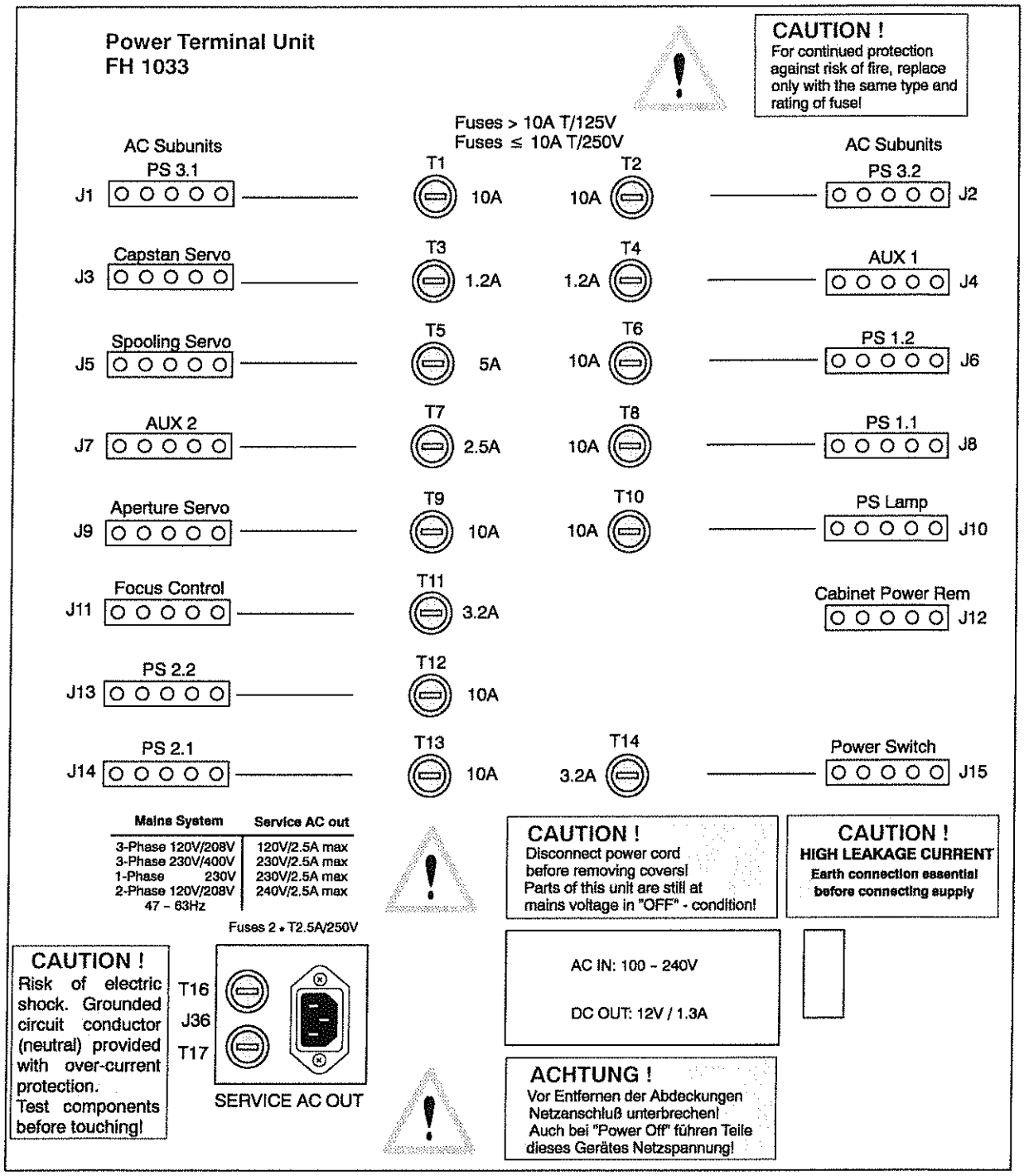


Fig. 461: Power terminal unit FH 1033

4.18.3 POWER TERMINAL UNIT 1-PHASE FH 1032 (230V)

The mains fuses set FH 1062 for the subunits are contained in the respective power terminal unit FH 1032. The dimensions of the fuses are 5 × 20mm.
The current ratings are written on the mounting plate beside the fuse holders for 230V as shown below:

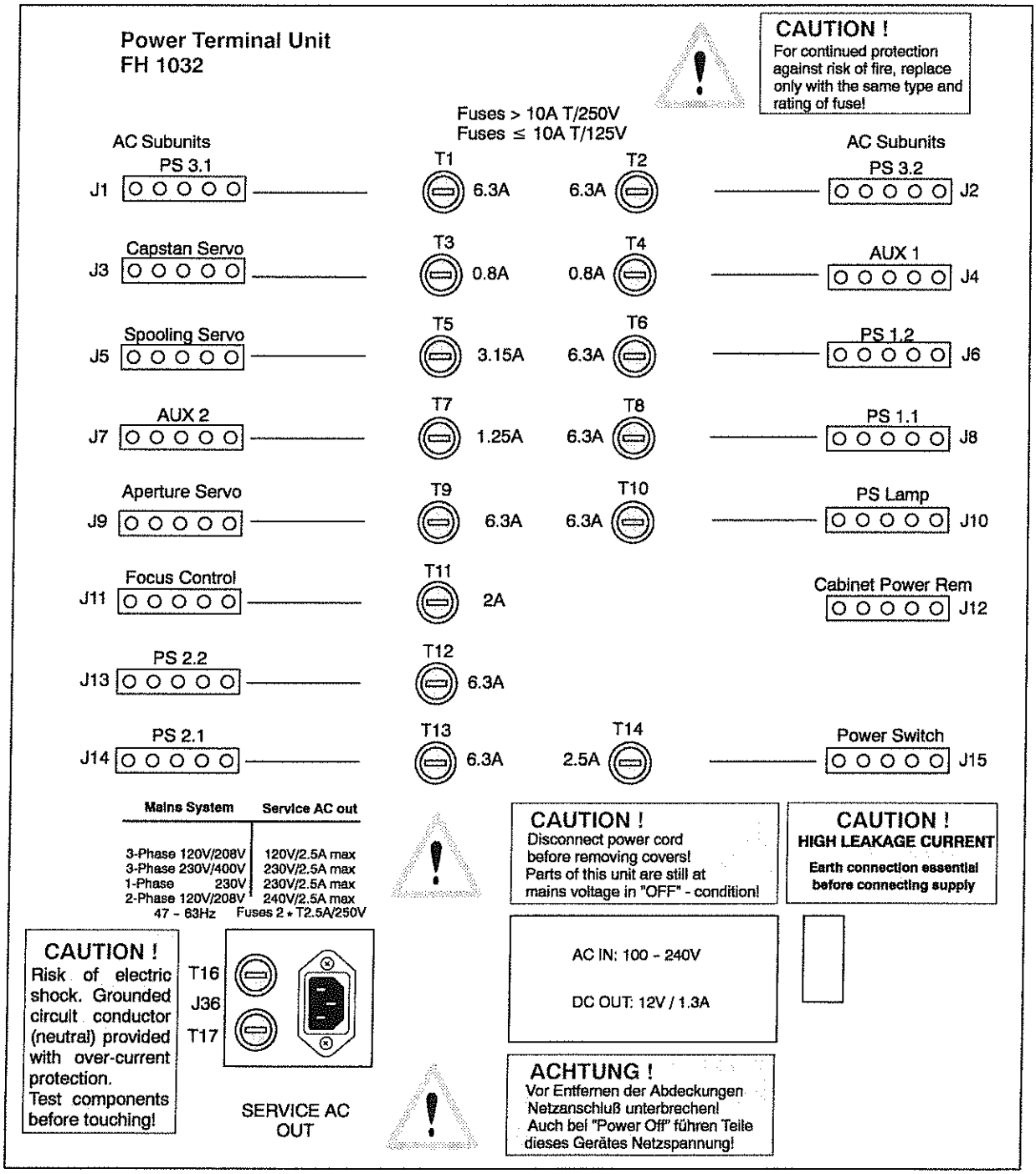


Fig. 462: Power terminal unit FH 1032

ATTENTION!

After having switched over to another mains voltage, make sure that the corresponding fuses are inserted. For this purpose, see the indicated fuse ratings on the front panels of the units or subunits.
The subunits also contain fuses which have to be changed!
(see chapter "Mains connection of subunits and mains voltage change")

When changing fuses, it is mandatory to use only high-breaking fuses links of same type and current rating as a replacement. Using mended fuses or shorting the fuse holder is not permissible.

For more details see circuit diagram 1-12810-31-SP (FH 1031)

CAUTION !

For continued protection against risk of fire, replace only with the same type and rating of fuse !

Overview fuses sets

Fuse no.	AC Subunit	Fuses set FH 1061	Fuses set FH 1062	Fuses set FH 1073
		3 phase (UL version) Mains system 120V / 208V L1(2,3) +N+PE UL 248.14 6.3 x 32 mm	**1 or 3 phase Mains system 230V Mains system 230V / 400V L1(2, 3) + N +PE IEC 127 5 x 20 mm**	**2 phase (UL version) Mains system -/ 208V L1 + L2 +PE UL 248.14 6.3 x 32 mm**
T1	Power Supply 3.1	T 15A	T 6.3A	T 10A
T2	Power Supply 3.2	T 15A	T 6.3A	T 10A
T3	Capstan Servo	T 2.5A	T 0.8A	T 1.2A
T4	Aux 1	T 2.5A	T 0.8A	T 1.2A
T5	Spooling Servo	T 10A	T 3.15A	T 5A
T6	Power Supply 1.2	T 15A	T 6.3A	T 10A
T7	Aux 2	T 4A	T 1.25A	T 2.5A
T8	Power Supply 1.1	T 15A	T 6.3A	T 10A
T9	Aperture Servo	T 10A	T 6.3A	T 10A
T10	P.S. Lamp	T 15A	T 6.3A	T 10A
T11	Focus Control	T 4A	T 2A	T 3.2A
T12	Power Supply 2.2	T 12A	T 6.3A	T 10A
T13	Power Supply 2.1	T 15A	T 6.3A	T 10A
T14	Power Switch	T 3.2A	T 2.5A	T 3.2A
T16	Service AC Out socket	T 2.5A	T 2.5A	T 2.5A
T17	Service AC Out socket	T 2.5A	T 2.5A	T 2.5A

5. CONNECTION OF EXTERNAL EQUIPMENT

5.1 EMC TERMINAL PANEL WITH CABLE FEED-THROUGH

To avoid EMC (electromagnetic compatibility) problems feed all connection cables (except iMCS connections) through the SDC 2002 cable feed through and contact the cable shields to ground with the earthing clamps or the EMI gasket.

Differences in coax and audio cable diameters should be compensated by using an EMI shielding tape with conductive adhesive.
The iMCS (internal machine communication system) connections have to be plugged onto the four RJ45 ports of the terminal panel, see chapter 5.6.

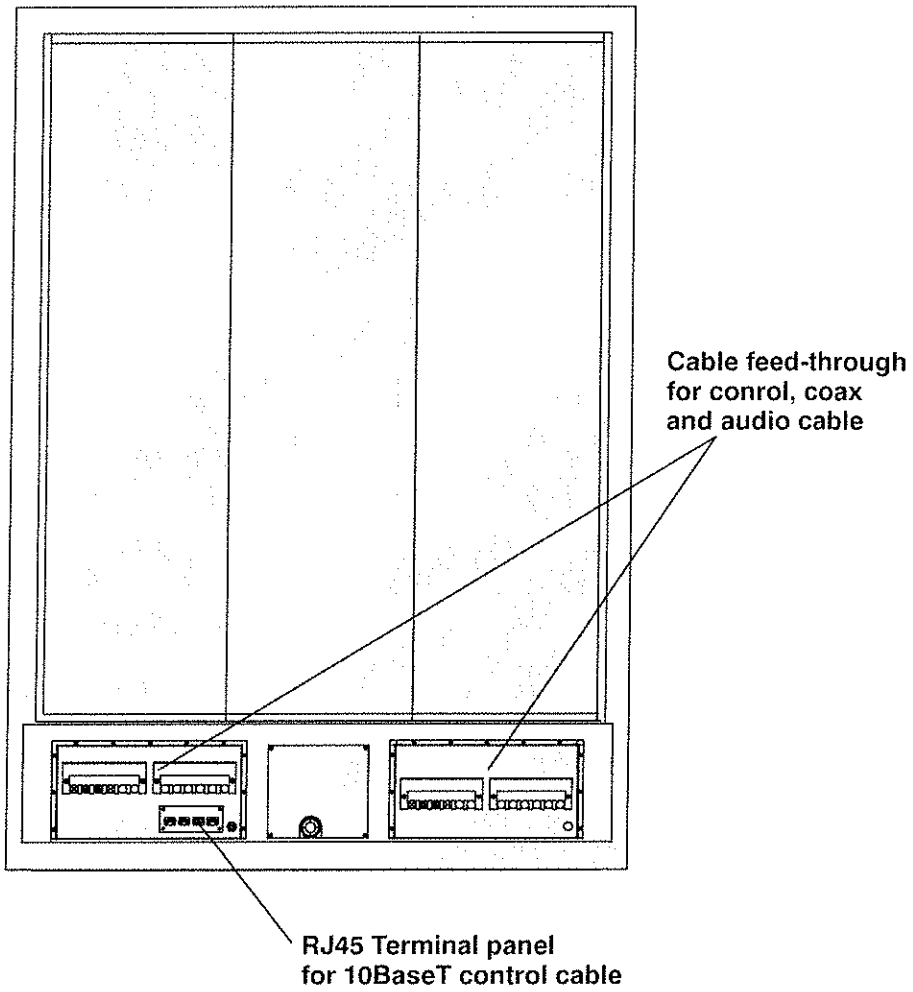


Fig. 500: SDC 2002, rear view

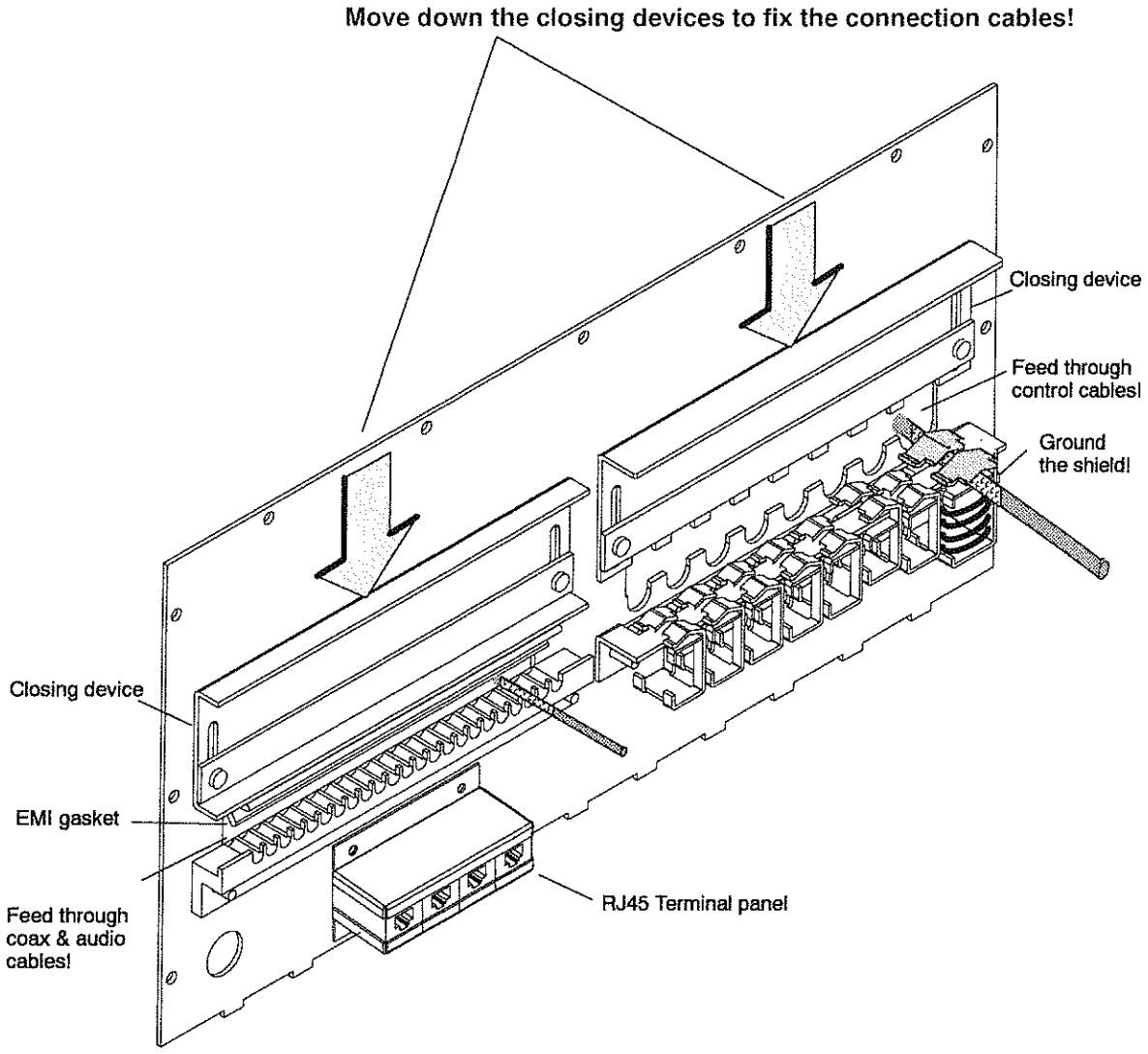

Move down the closing devices to fix the connection cables!
Closing device
Feed through control cables!
Ground the shield!
Closing device
EMI gasket
Feed through coax & audio cables!
RJ45 Terminal panel

Fig. 501: Rear view of the cable feed through

5.2 OVERVIEW CONNECTION UNITS RACK 1 - 3

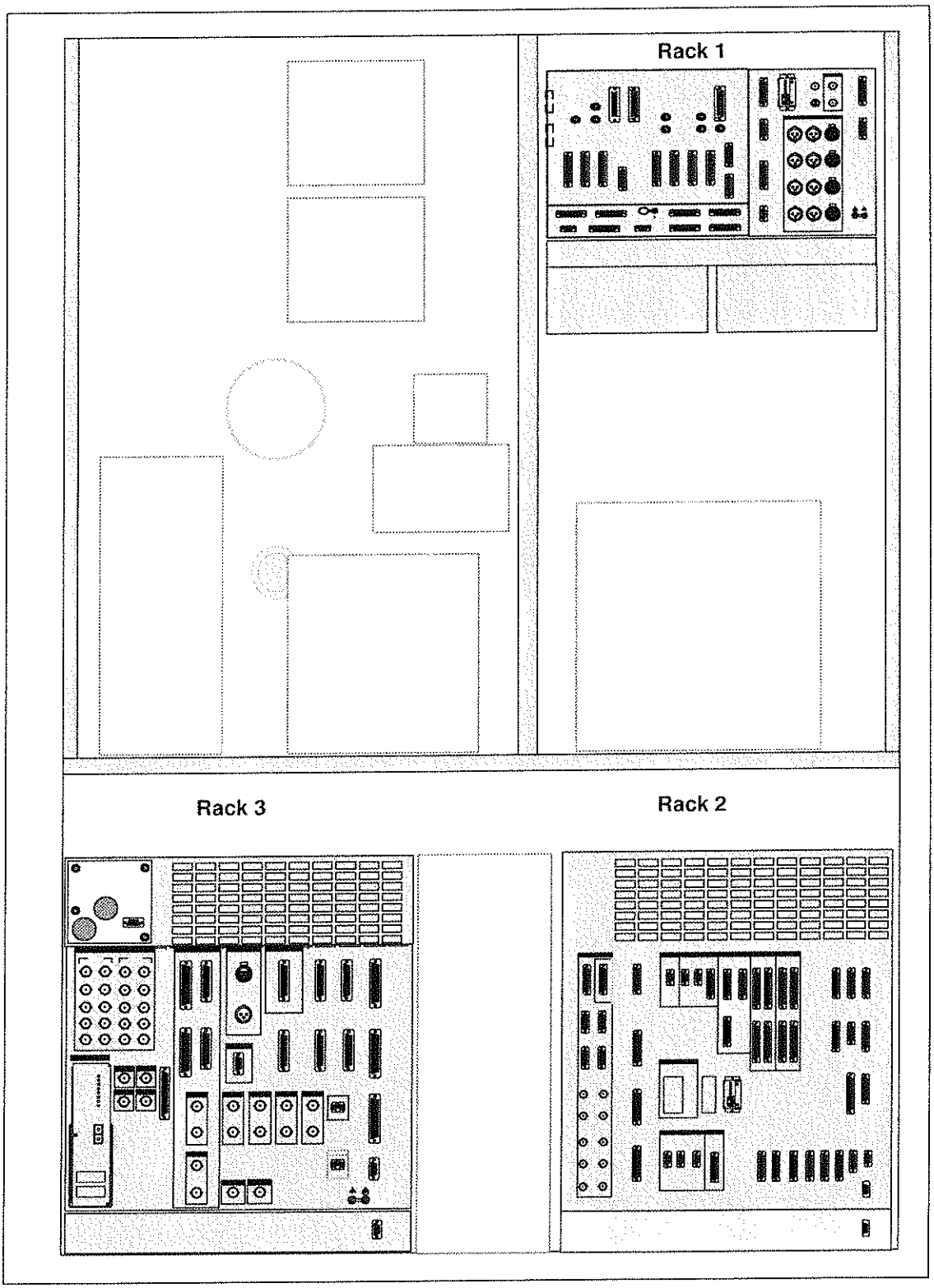


Fig. 502: Spirit DataCine Film Scanner, rear view

5.3 CONNECTION UNIT AUDIO & VIDEO (RACK 1)

Audio

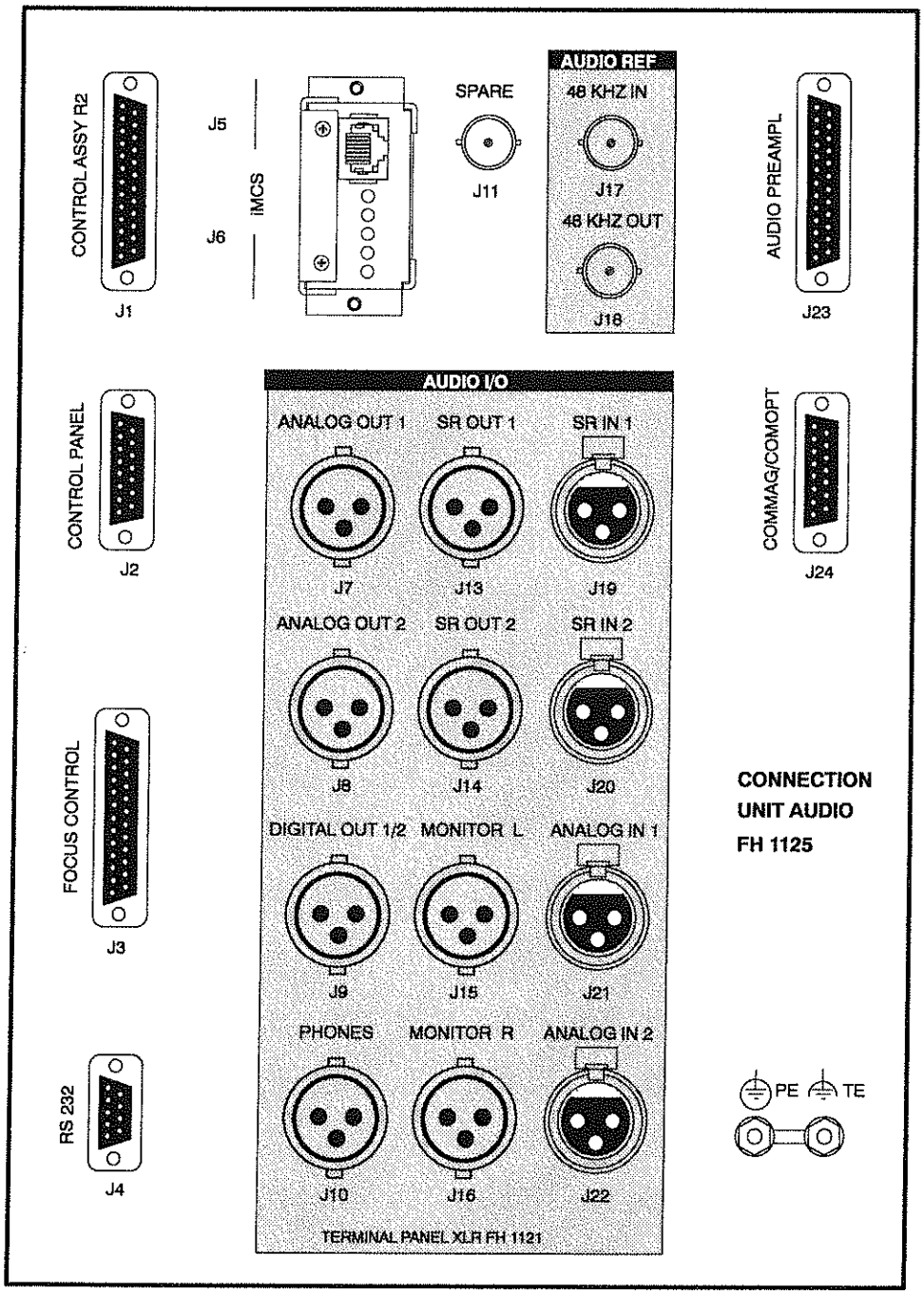


Fig. 503: Connection unit AUDIO: FH 1125 (Rack 1)

Video

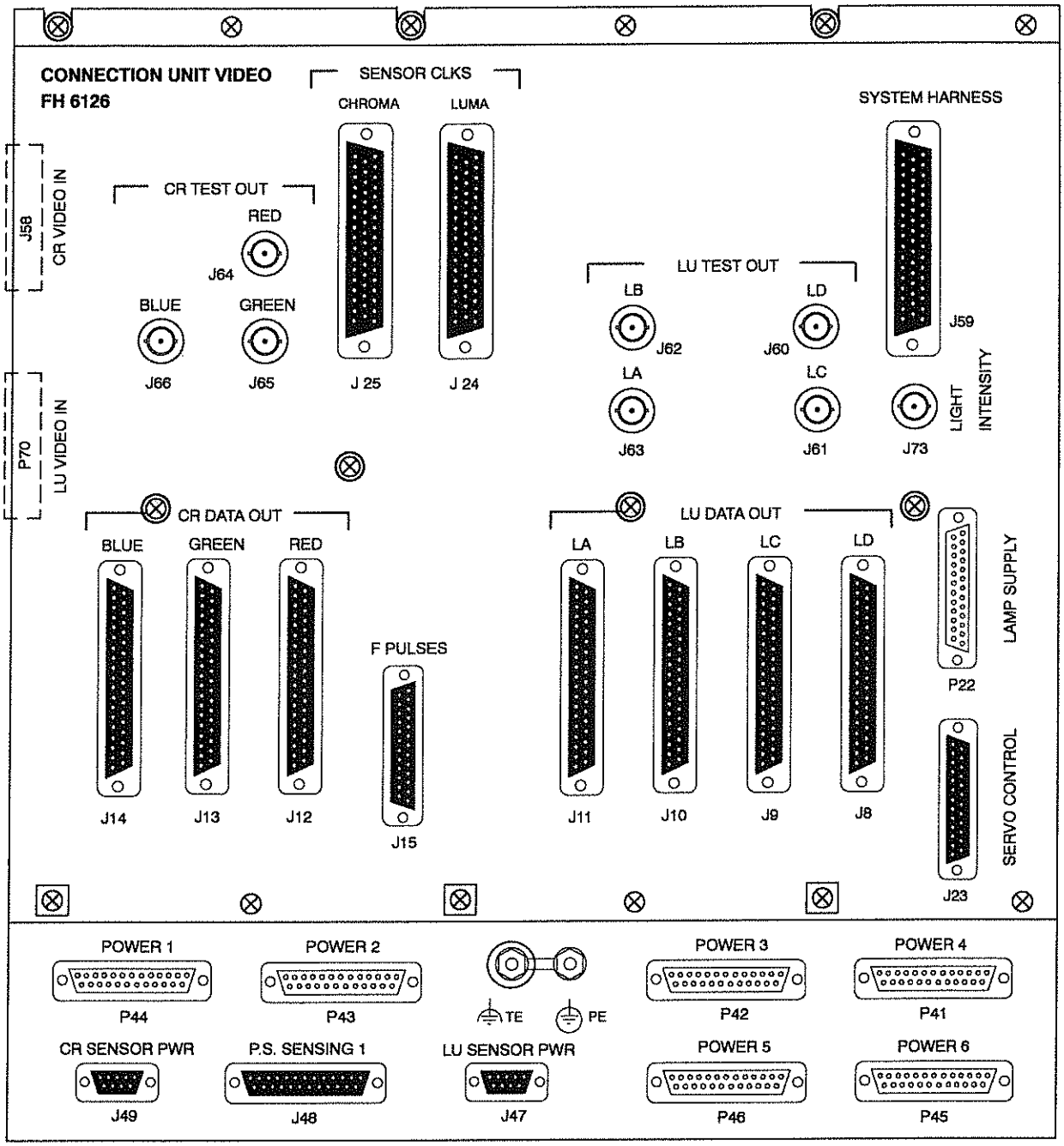


Fig. 504: Connection unit Video: FH 6126 (Rack 1)

5.3.1 AUDIO INPUTS AND OUTPUTS (XLR)

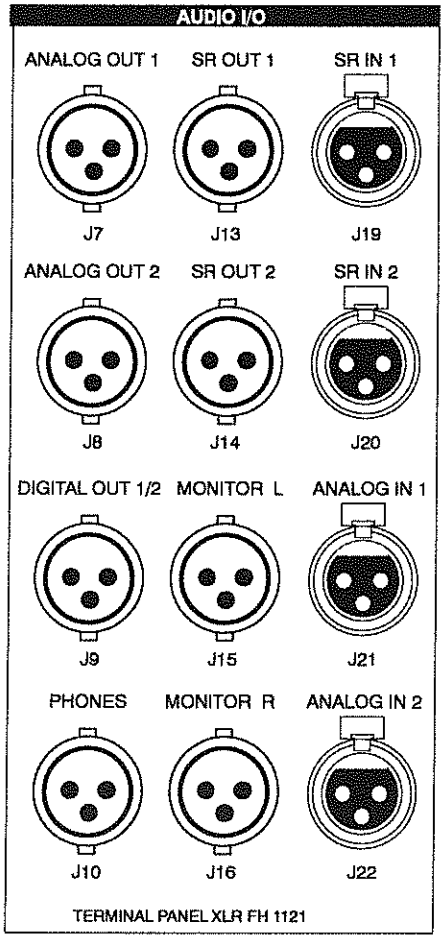


Fig. 505: Terminal panel XLR: FH 1121 (on terminal panel FH 1119)

ANALOG IN 1, J21
ANALOG IN 2, J22

Symmetrical audio inputs, XLR femal, impedance > 10 kOhm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.

ANALOG OUT 1, J7
ANALOG OUT 2, J8

Symmetrical audio outputs, XLR male, impedance < 40 Ohm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.

MONITOR L, J15
MONITOR R, J16

Symmetrical analog audio output Left or Right for monitoring (active speaker),
XLR male, impedance < 40 Ohm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.
Volume control from $-\infty$ to +6 dB by the multifunction dial on the control panel.

PHONES, J10

Symmetrical analog **stereo** output for headphones,
XLR males, impedance 150 Ohm. Minimum load 32 ohm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.
The volume is also controlled by the multifunction dial on the control panel.

pinning:	pin 1	ground
	pin 2	left channel
	pin 3	right channel

SR IN 1, J19
SR IN 2, J20

Symmetrical audio inputs for the feed-in of a Dolby-SR-audio signal, XLR females, impedance > 10 kOhm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.

SR OUT 1, J13
SR OUT 2, J14

Symmetrical audio outputs for the Dolby-SR-audio signals, XLR males, impedance < 40 Ohm.
Level switchable -3, 0, 4, 8 dBu for 0 VU = 9 dB below normal level.

DIGITAL OUT 1/2, J9

Digital, serial interface for the audio channels, based on the AES-EBU s

tandard. Mono/Stereo interface.
AES Recommended Practice Draft AES 3-1992 (ANSI S4.40, 1992)
Impedance 110 Ohm
Level: inputs 0.2 Vpp to 10 Vpp
outputs 3 Vpp to 10 Vpp

At pins 2 and 3 of the XLR male the push-pull signals are connected via twisted-pair cable.

pinning:	pin 1	screening
	pin 2	signal
	pin 3	signal

5.3.2 CONNECTIONS AUDIO REF

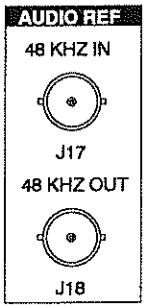


Fig. 506: Terminal panel AUDIO: FH 1119 (Rack 1)

48KHZ IN, J17

Input to feed in an external 48 kHz word clock, to synchronize the DataCine audio processor with external, digital audio components.
BNC connector
Without external 48 kHz signal, the digital audio is synchronized with the video output signal.

48KHZ OUT, J18

48 kHz clock output to synchronize external, digital audio components.
BNC connector

5.4 CONNECTION UNIT FH 6235 (RACK 2)

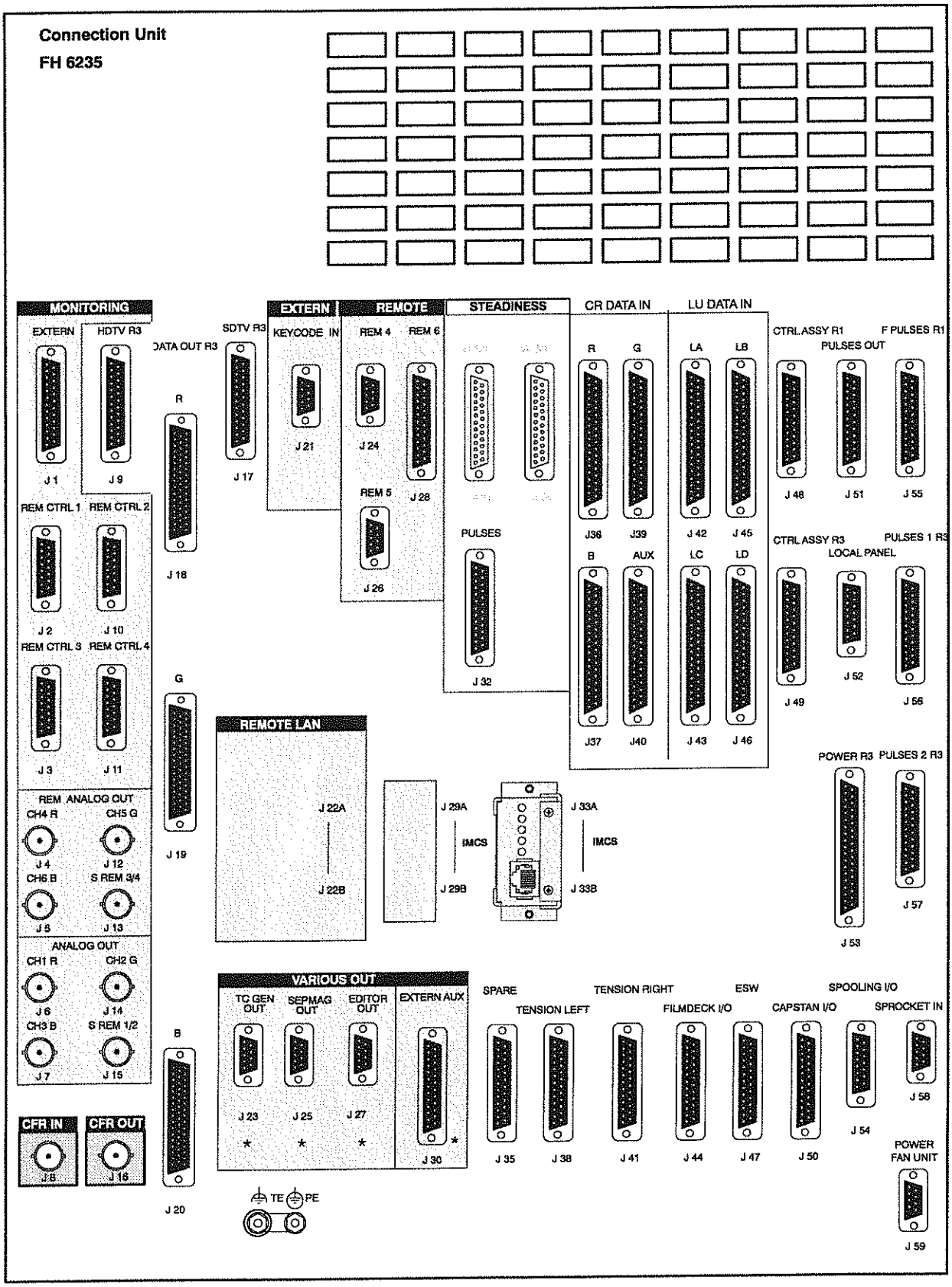


Fig. 507: Connection Unit FH 6235

5.4.3 VARIOUS OUT

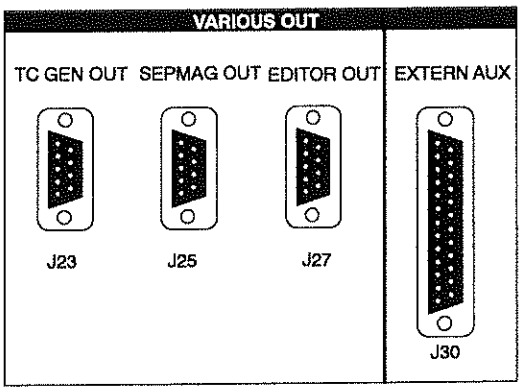


Fig. 511: On connection unit FH 6235 (Rack 2)

TC GEN OUT, J23 Timecode generator or keycode reader interface.

9-pin submin D female

Pinning:

Pin no.	Signals with Capstan Ctrl. FY 1202	Signals with Capstan Ctrl. FY 6202
1	1x BI Phase (25 / 24 Hz) R Signal	1x or 2x or 10x Bi Phase R Signal
2		SOF Pulse
4	Pre stop	Pre stop
5	1x BI Phase (25 / 24 Hz) S Signal	1x or 2x or 10x Bi Phase S Signal
7	GNDD (Digital)	GNDD (Digital)
9	+5V (Digital) *	+5V (Digital) *

Signal details, see also next chapter 5.4.3.1

SEPMAG OUT, J25 Sepmag interface (two-phase interlock signal)

9-pin submin D female.
Pinning:

Pin no.	Signals with Capstan Ctrl. FY 1202	Signals with Capstan Ctrl. FY 6202
1	2x or 10x BI Phase R Signal	1x or 2x or 10x Bi Phase RSignal
5	2x or 10x BI Phase S Signal	1x or 2x or10xBi Phase S Signal
7	GNDD (Digital)	GNDD (Digital)
9	+5V (Digital) *	+5V (Digital) *

Signal details, see also next chapter 5.4.3.1

EDITOR OUT, J27 Editor interface

Note! Function only with Capstan Control Board FY 6202

9-pin submin D female.
Pinning:

Pin no.	Signal
1	BI Phase R Signal
2	SOF (Pulldown)
4	CFR OUT
5	BI Phase S Signal
7	GNDD (Digital)
9	+5V (Digital) *

Signal details, see also next chapter 5.4.3.1

5.4.1 EXTERN KEYCODE IN

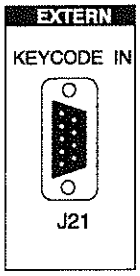


Fig. 508: On connection unit FH 6235 (Rack 2)

KEYCODE IN, J21 9-pin subminiature D-connector,
RS 232 input ,
Interface to read e.g. KEYCODE information for insertion into VITC or LTC user bits.

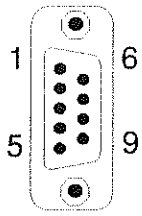
9-pin Sub-D-Connector	pin no	RS 232 I.F.
	1	
	2	TxD
	3	RxD
	4	
	5	Ground
	6	
	7	
	8	
	9	

Fig. 509: Pinning KEYCODE IN

The connection from the keycode reader device (decoder)

EVERTZ:
"Serial I/O" to the keycode reader input of SDC 2000 Rack 2 - KEYCODE IN J21 (9 pin / RS 232).

Cable

Evertz / ARRI	SDC 2000
Sub-D 9 pin (male)	Sub-9 pin (male)
3 ----------	2 Tx
2 ----------	3 Rx
5 ----------	5 GND

ARRI:
"Serial I/O" to the keycode reader input of SDC 2000 Rack 2 - KEYCODE IN J21 (9 pin / RS 232).

Cable

Evertz / ARRI	SDC 2000
Sub-D 9 pin (male)	Sub-9 pin (male)
2	2 Tx
3	3 Rx
5	5 GND

AATON:
"Keylink Com 1" to the keycode reader input of SDC 2000 Rack 2 - EXTERN KEY-CODE IN J21 (9 pin / RS 232).

Cable 1 (Keycode in Data)

AATON	SDC 2000
Keylink Com 1	Keycode In
Sub-D 25 pin (male)	Sub-9 pin (male)
3	2 Tx
2	3 Rx
7	5 GND

Cable 2 (required by AATON keylink system)
(is part of the AATON Keylink System)
Keylink PC "MTC board top socket" to the bi phase sync signal output of SDC 2000 Rack 2 - TC GEN OUT - J23 (9 pin / control I.F.).
Pinning, see chapter **5.4.3**.

5.4.2 CFR IN / OUT

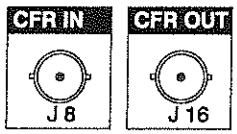


Fig. 510: On connection unit FH 6235 (Rack 2)

CFR IN, J8 Color Frame Reference In
TTL input, used by Programmer/Editor systems to synchronize film to tape transfer

CFR OUT, J16 Color Frame Reference Out
TTL output, used for synchronization of Programmer / Editor (e.g. Pogle)

Signal details, see also next chapter 5.4.3.1, figure 516.

EXTERN AUX, J 30

EXTERN AUX is a telecine controller interface based on serial RS 422 standard. It serves to connect the following controller devices with the film scanner:

- Pogle — Pandora
- DaVinci — Renaissance
- Sunburst — Colorvision

25-pin subminiatur D female / Pinning:

pin-no.	Signal	pin-no.	Signal
1	Reserved for Film_TC_TxD_A	14	Reserve, Common
2	Reserved for Film_TC_TxD_B	15	Ground
3	Film_TC_Common	16	SOF_Studio_A
4	Reserved for Film_TC_RxD_A	17	SOF_Studio_B
5	Reserved for Film_TC_RxD_B	18	SOF_Studio_Common
6	SOF_Film_Common	19	FWD/REV_A (Forward = High)
7	Reserved for Studio_TC_TxD_A	20	FWD/REV_B
8	Reserved for Studio_TC_TxD_B	21	+ 5 V *
9	Studio_TC_Common	22	Reserved for, TxD_A
10	SOF_Film_A	23	Reserved for, TxD_B
11	SOF_Film_B	24	Reserved for, RxD_A
12	Reserved for Studio_TC_RxD_A	25	Reserved for, RxD_B
13	Reserved for Studio_TC_RxD_B		

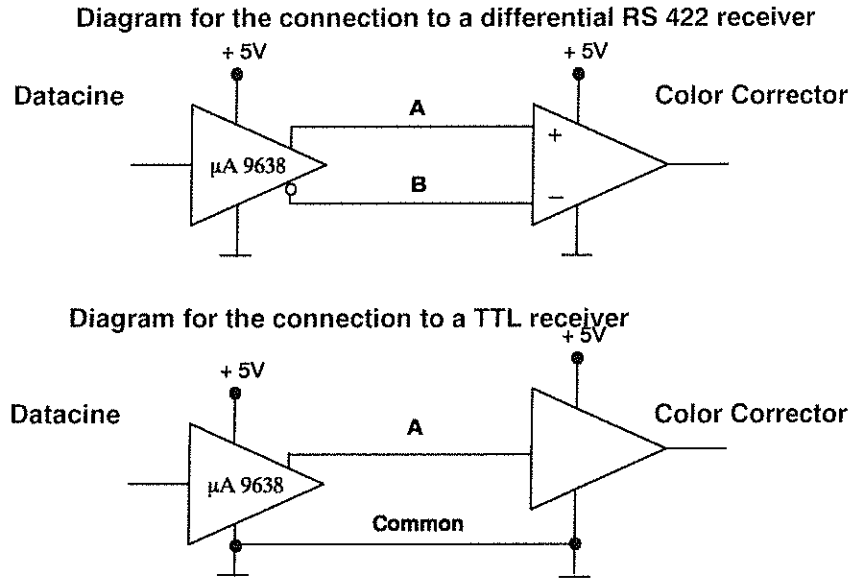


Fig. 512: Examples for the connection to the color corrector

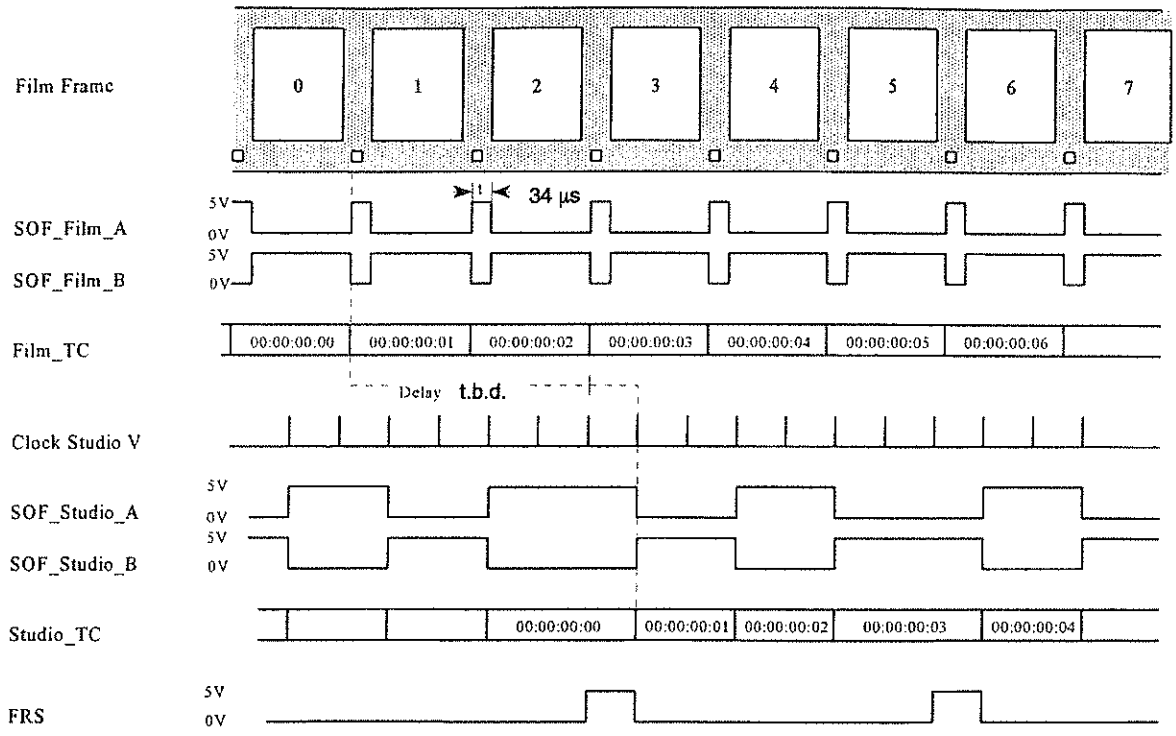


Fig. 513: Timing SOF_Film pulse:
t =**34** µsec in all modes

5.4.3.1 Description of biphase Signal, SOF Pulse and CFR OUT Pulse

Biphase R & S Signal

configurable to 10x Biphase (250 / 240 Hz) or
2x Biphase (50 / 40 Hz) or
1x Biphase (25 / 24 Hz)

Independent of the film formats 16mm and 35mm, 2-, 3-, 4-, 6-, 8perf.

See Functional Control Panel FCP Chapter 4 Setup menu, Setup Genlock, Sepmag coupling.

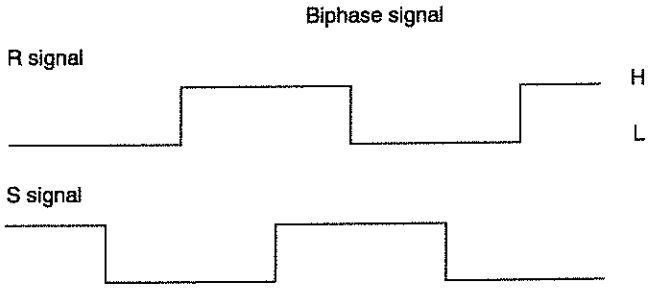


Fig. 514:

Output parameter:
transistor collector output with 1kOhm pull-up to +5V
U_{CE} = 40V max
I_C = 10mA max
U_{CEsat} = 0.2V

SOF Signal (Pulldown)

SOF (Start of frame) e. g. used for EVERTZ film footage encoder 4025.

TTL Output drive: 74 FCT 2244

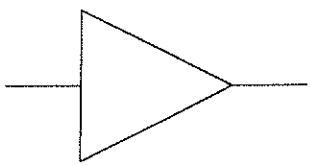


Fig. 515: SOF output driver

More details, see also figure 513 and figure 518

CFR OUT Pulse

Color Frame Reference

TTL Output drive: 74 FCT 244 ASO

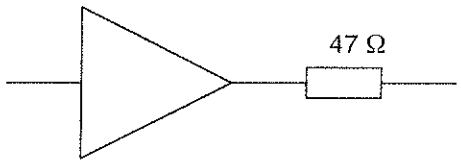


Fig. 516: CFR output driver

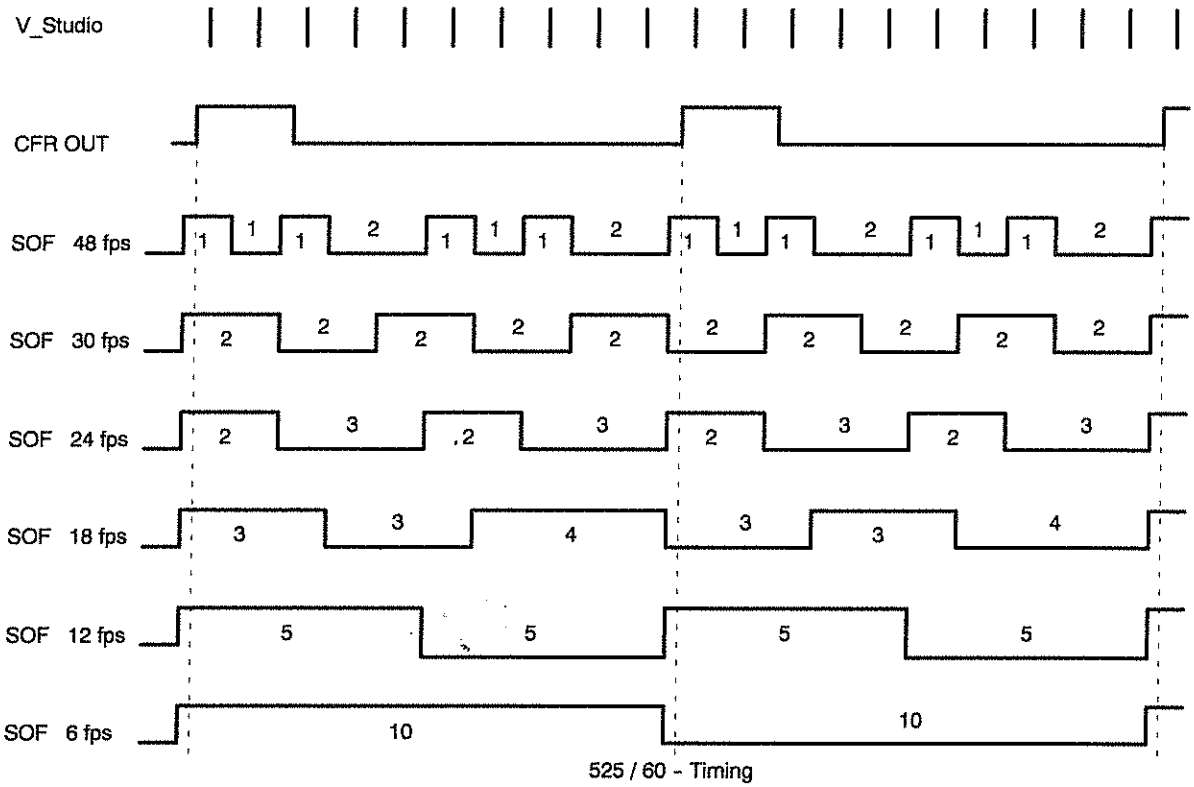


Fig. 517: Coarse Timing CFR OUT Pulse 525

Fixed speeds, except SAS, fit into 8V /50 Hz or 10V /60 Hz sequences. The figure 518 shows the pull down sequences for the 525 / 60 Hz and 625 / 50 Hz mode.

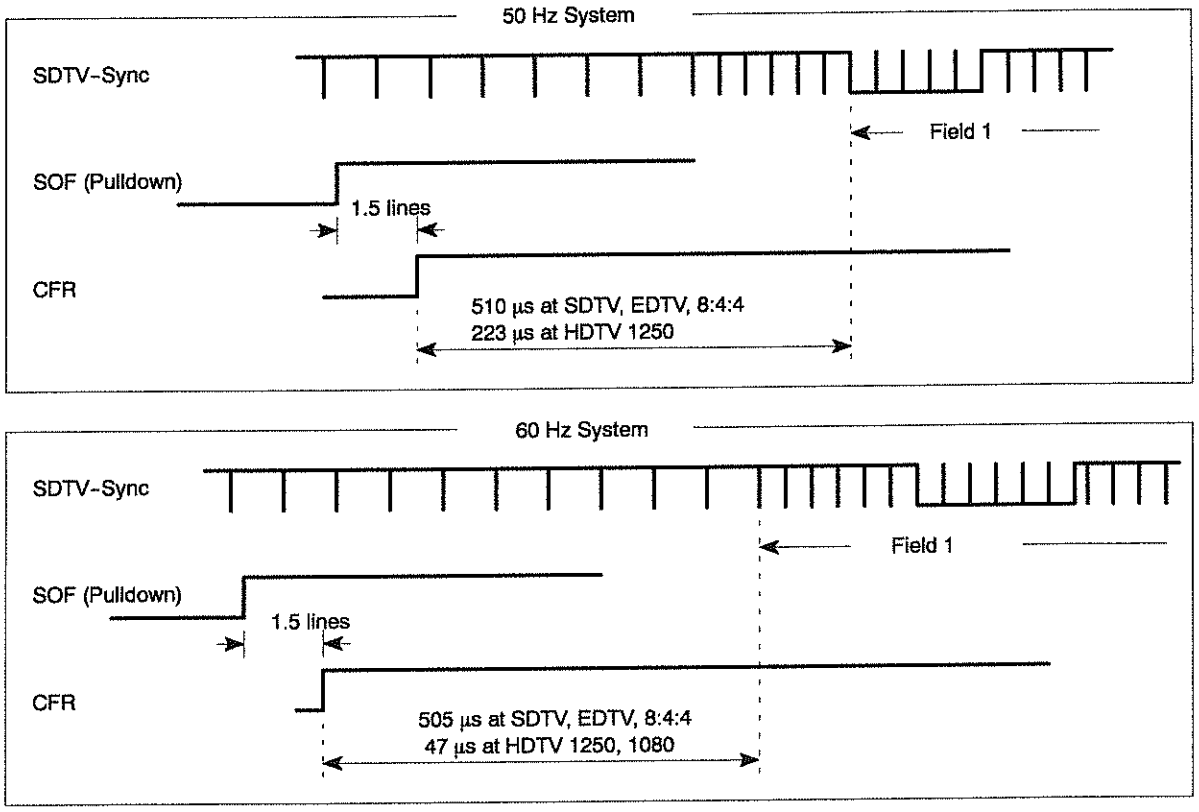


Fig. 518: Timing CFR OUT Pulse

Note!
Control signal timing diagram for (H)DTV standards 1920 x 1080 and 1280 x 720 see manual "FH 1635 Option DTV" FU 0082.

5.4.4 REMOTE Systems / RJ 45 - iMCS

Overview of remote interfaces

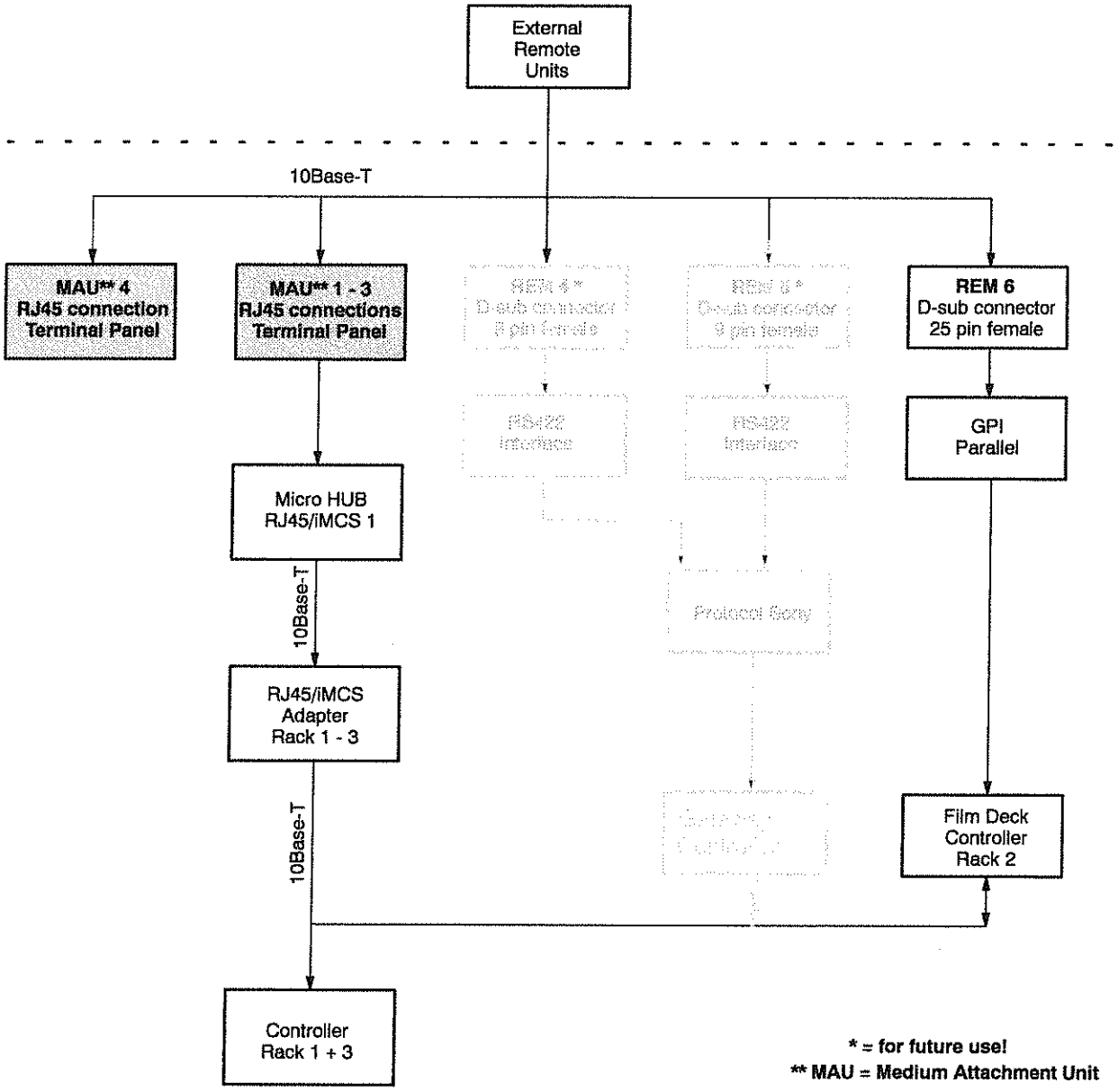

External Remote Units
10Base-T
MAU** 4 RJ45 connection Terminal Panel
MAU** 1 - 3 RJ45 connections Terminal Panel
REM 6 D-sub connector 25 pin female
GPI Parallel
Micro HUB RJ45/iMCS 1
10Base-T
RJ45/iMCS Adapter Rack 1 - 3
10Base-T
Film Deck Controller Rack 2
Controller Rack 1 + 3
* = for future use!
** MAU = Medium Attachment Unit

Fig. 519: Remote System IMCS and GPI

See also chapter 10 "Interfaces" in this manual.

5.4.5 RJ45 / IMCS J33

Only for internal use!

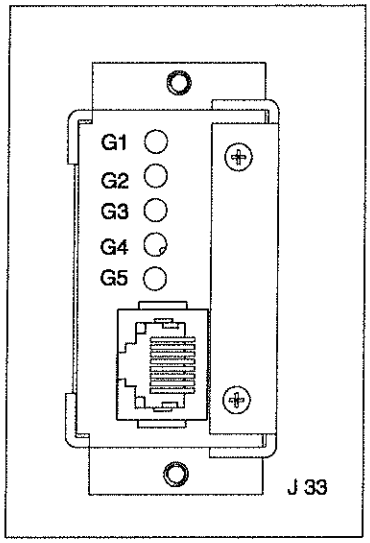


Fig. 520: Part of the Connection Unit FH 6235 (Rack 2)

G1 green active: Link pulse detected - Network link is intact!

G2 yellow active: Transmit activity

G3 yellow active: Receive activity

G4 yellow active: Collision occurring on RJ45 I.F.

G5 red active: Polarity of RJ45 Interface incorrect

Socket / Connector Description	Socket type Connector type	Function
J 33 iMCS	RJ45 connector female	This RJ45 connector is used to control the film scanner and is connected to the RJ 45 Terminal Panel. J 33, AT-MR820TR Ethernet 10-Base-T Micro HUB **ANSI standard** Standard IEEE 802.3 Data rate 10 Mbit/sec Cable length max. 100 m Cable type STP7UTP Category 3 or better Connector RJ45

Note! If required, connect Functional Control Panel, diagnostics PC or telecine controller to the RJ45 Terminal Panel, see figure 542.

5.4.6 REMOTE 4 - 6

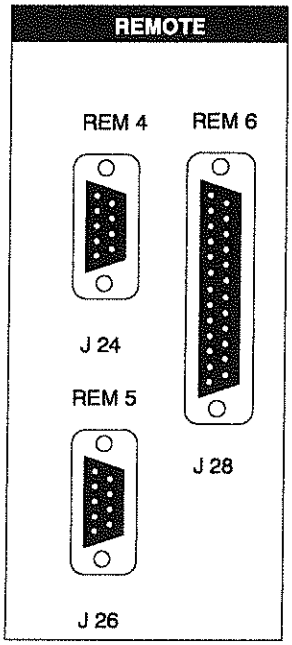
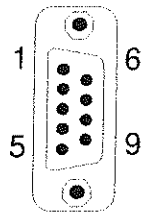


Fig. 521: On terminal panel FM 6225 (Rack 2)

REM 4 - 5, J 24 / 26

RS 422 Interface connector not yet supported

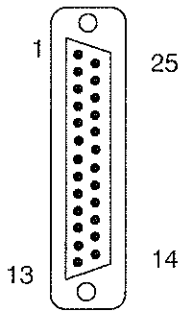
9-pin submin D female

9-pin Sub-D-Connector	pin no.	Signal
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	

REM 6, J 28

Parallel port for external simple control panels referenced to proposed SMPTE recommended practice for D-1 format, dated February 1st, 1989 and adapted to film scanner requirements.
Command format: active low.
25-pin male subminiature D connector.

Pinning

REM 6	Pin No.	Signal Parallel (Standard mode)
 25 pole D-type male	1	STOP SW
	2	FAST FWD SW
	3	FAST REWIND SW
	4	PLAY SW
	5	PLAY REVERSE SW
	6	STOP LAMP
	7	FWD LAMP
	8	REWIND LAMP
	9	PLAY LAMP
	10	PLAY REVERSE LAMP
	11	GND
	12	GND
	13	-
	14	-
	15	-
	16	-
	17	-
	18	-
	19	-
	20	-
	21	-
	22	Identification
	23	-
	24	+ 5 V (maximum current 750 mA / R_i = 0.4Ω)
	25	+ 5 V (maximum current 750 mA / R_i = 0.4Ω)

Notes

- all switch pins go to +5 V through 1kOhm
- all lamp feeds are 5V.

Remote 6 (GPI) is used for 16mm and 35mm wetgate systems.

5.4.7 PULSES STEADINESS J32

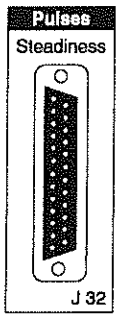


Fig. 522: Part of the Connection Unit FH 6225 (Rack 2)

Socket / Connector Description	Socket type Connector type	Function
J 32 Steadiness	25-pin subminiature D-connector female	For option FH 6700 Steadiscan

5.4.8 WAVEFORM MONITORING

Waveform Monitoring Board FY 1408 required!

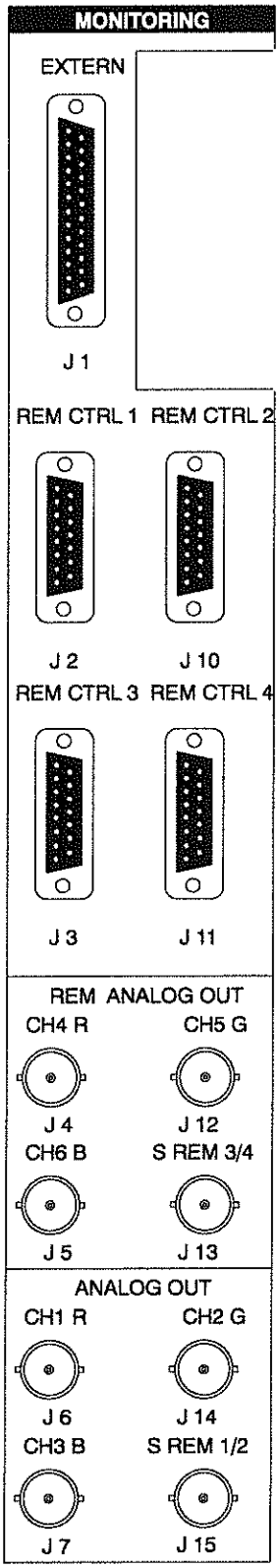


Fig. 523:

EXTERN, J1 Spare, not used!
25-pin D submin female

REM CTRL
J2, J10
J3, J11

For remote control of waveform monitors
4x15-pin D submin female
Cable length max. 50m
Sustained types of waveform monitors are :

- TEK WFM 300/300A SDTV only
- Philips PT 5464 HD
  all standards, waveform and vector display
- Philips PM 5664 SDTV
  Note!
  Disconnect pin1 and 2 on each side of the control cable PM 5664, otherwise the remote control functions are disturbed.
- Tek 1735/1730 HD
  SDTV & HDTV, 2x3 BNC inputs available
- Tek 1740/1750/1760 SDTV
  Storing the presetes - via menu MONITORING F11 preset WFM "Preset for WFM 300" F10 STORE - is not supported.
  Use the front control panel for storing presets.
  Create a connection cable as follows:

15pin D-Submin male	25pin D-Submin male	Function
pin 9	pin 14	GND
pin 5	pin 18	Recall 2 Superimposed
pin 6	pin 19	Recall 3 Vector
pin 7	pin 17	Recall 1 Parade

REM ANALOG OUT
J4, J5
J12, J13

Two sets of analog outputs for connection of waveform monitors. (Level adjustable on board FY 1408 via pot to equalize different cable lengths).

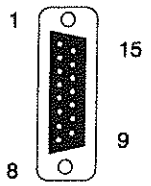
ANALOG OUT
J6, J7
J14, J15

REM CTRL
J2, J10
J3, J11

Remote control of waveform monitors

15-pin D-Min female connector

Pinning:

	Pin-No.	REM CTRL 1	REM CTRL 2	REM CTRL 3	REM CTRL 4
 15 pole D-Sub female	1	WFM-CTRL1-1	WFM-CTRL2-1	WFM-CTRL3-1	WFM-CTRL4-1
	2	WFM-CTRL1-2	WFM-CTRL2-2	WFM-CTRL3-2	WFM-CTRL4-2
	3	WFM-CTRL1-3	WFM-CTRL2-3	WFM-CTRL3-3	WFM-CTRL4-3
	4	WFM-CTRL1-4	WFM-CTRL2-4	WFM-CTRL3-4	WFM-CTRL4-4
	5	WFM-CTRL1-5	WFM-CTRL2-5	WFM-CTRL3-5	WFM-CTRL4-5
	6	WFM-CTRL1-6	WFM-CTRL2-6	WFM-CTRL3-6	WFM-CTRL4-6
	7	WFM-CTRL1-7	WFM-CTRL2-7	WFM-CTRL3-7	WFM-CTRL4-7
	8	WFM-CTRL1-8	WFM-CTRL2-8	WFM-CTRL3-8	WFM-CTRL4-8
	9	WFM-GND1	WFM-GND2	WFM-GND3	WFM-GND4
	10	WFM-CTRL1-10	WFM-CTRL2-10	WFM-CTRL3-10	WFM-CTRL4-10
	11	WFM-CTRL1-11	WFM-CTRL2-11	WFM-CTRL3-11	WFM-CTRL4-11
	12	WFM-CTRL1-12	WFM-CTRL2-12	WFM-CTRL3-12	WFM-CTRL4-12
	13	WFM-CTRL1-13	WFM-CTRL2-13	WFM-CTRL3-13	WFM-CTRL4-13
	14	WFM-CTRL1-14	WFM-CTRL21-14	WFM-CTRL3-14	WFM-CTRL4-14
	15	WFM-CTRL1-15	WFM-CTRL2-15	WFM-CTRL3-15	WFM-CTRL4-15

Output drivers: Opto-coupler PC 354
Open collector
Control outputs electrically insulated from the film scanner
Pullup resistors are in the particular waveform monitor
GND Pin 9 is connected via 1MΩ resistor to film scanner ground

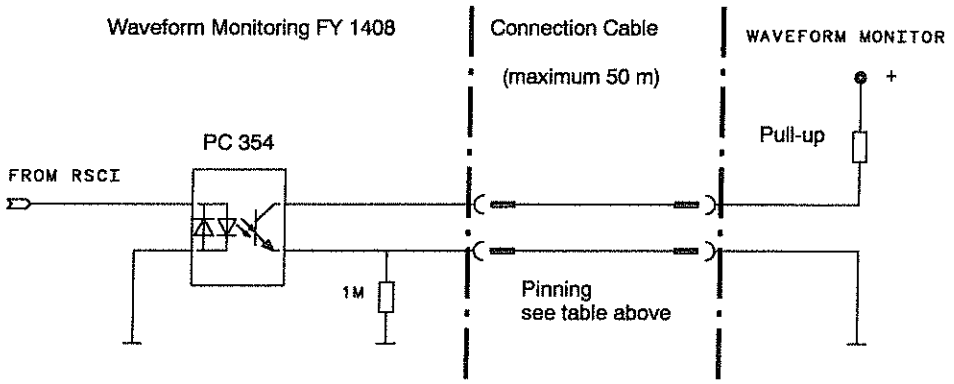


Fig. 524: Output driver

5.4.9 Table of supported Waveform Monitors

	Table of supported Waveform Monitors								
Manufacturer & Type	**Leader LV5100**	**Leader LV5152**	**Philips PT5464**	**TEK 1735HD**	**TEK 1730HD**	**TEK WFM300A**	**TEK WFM300**	**TEK 1740-1760**	**Philips PM5664**
Store presets from WFM Frontpanel	yes	yes	yes	no	no	yes	no	no	no
Recall presets from WFM Frontpanel	yes	yes	yes	no	no	yes	no	no	yes
Store disabel via WFM Front-panel	yes	t.b.d.	yes	no	no	no	no	no	no
Store from Remote connector	no	t.b.d.	no	yes	yes	no	yes	yes	yes
Recall from Remote connector	yes	t.b.d.	yes	yes	yes	yes	yes	yes	yes
Store disabel Remote connector	no	t.b.d.	no	yes	yes	yes	yes	yes	yes
Vectormode YCrCb	yes	yes	yes	no	no	yes	yes	yes	yes
1line/2lines con-trol via remote	yes	yes	yes	yes	yes	no	no	no	yes
Automatik TV-Standard detec-tion	yes	t.b.d.	yes	no	no	yes	yes	yes	yes
User action nec-essary for changing TV-Standard	no	t.b.d.	no	yes	yes	no	no	no	no
525 Lines supported	yes	no	yes	yes	yes	yes	yes	yes	yes
625 Lines supported	yes	no	yes	yes	yes	yes	yes	yes	yes
1080 Lines supported	yes	yes	yes	yes	yes	no	no	no	no
1125 Lines supported	yes	no	yes	yes	yes	no	no	no	no
1250 Lines supported	no	no	yes	yes	yes	no	no	no	no
720 Lines supported	no	yes	no	no	no	no	no	no	no

Further WFM Recommendation!

- The scopes type LV 5100 and LV 5112 of the manufacturer "Leader" may be used without remote control from the Spirit DataCine, which normally is not required.
- In addition an HD / SD Scope with SDI inputs connected to an external Secondary Color Corrections is helpful.

- The HD scope WFM700 is useful to check the output of the Spirit DataCine, if connected to the serial HD Link A output. An serial HD scope cannot be connected to the test point selection output for monitoring the signal path before.
- The best monitoring solution for both SDTV and HDTV is a HD Scope with analog RGBS inputs connected to the Spirit DataCine Monitoring Outputs at the Terminal Panel Rack 2, see figure 523

5.4.10 MONITORING SIGNAL SYNCHRONIZATION FOR DTV STANDARDS

In the SDTV and HDTV "interlaced modes" the monitoring signal is displayed with its appropriate sync signal.

If the Spirit DataCine operates in one of the following DTV modes

- 1280 x **720** / **60** Hz progressive
- 1280 x **720** / **59.94** Hz progressive
- 1920 x **1080** / **24** Hz progressive
- 1920 x **1080** / **23.98** Hz progressive
- 1920 x **1080** / **25** Hz progressive
- 1920 x **1080** / **24** segmented frame
- 1920 x **1080** / **23.98** segmented frame

the monitoring displays the signal asynchronously in a sync-frame of 1125 lines 60 / 59.94 Hz.

Restrictions

Monitoring restrictions for the standards 1280x720 and 1920x1080!

- All selectable measurement points of the monitoring, up to the spatial processor, show all pixels and lines on an HDTV monitor.
  However, if the outputs of the HOA or HOD board are selected, the pixels from 921 up to the end of all lines are not displayed at present.

5.4.11 MONITORING SIGNAL SYNCHRONIZATION FOR DATA MODE

If the Spirit DataCine operates in the Data mode 50 /60 Hz, the monitoring displays the signal asynchronously in a sync-frame of 1250 lines 50 / 60 Hz.

Restrictions

Monitoring restrictions in Data mode!

- Last test point available behind Primary Color Correction.
  No monitoring test point in Rack 3 (Data Output board).

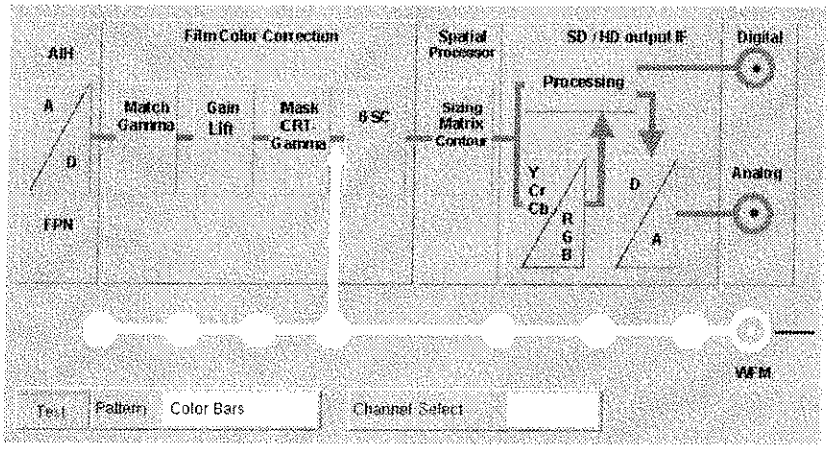


Fig. 525:

5.5 CONNECTION UNIT FH 6355 RACK 3

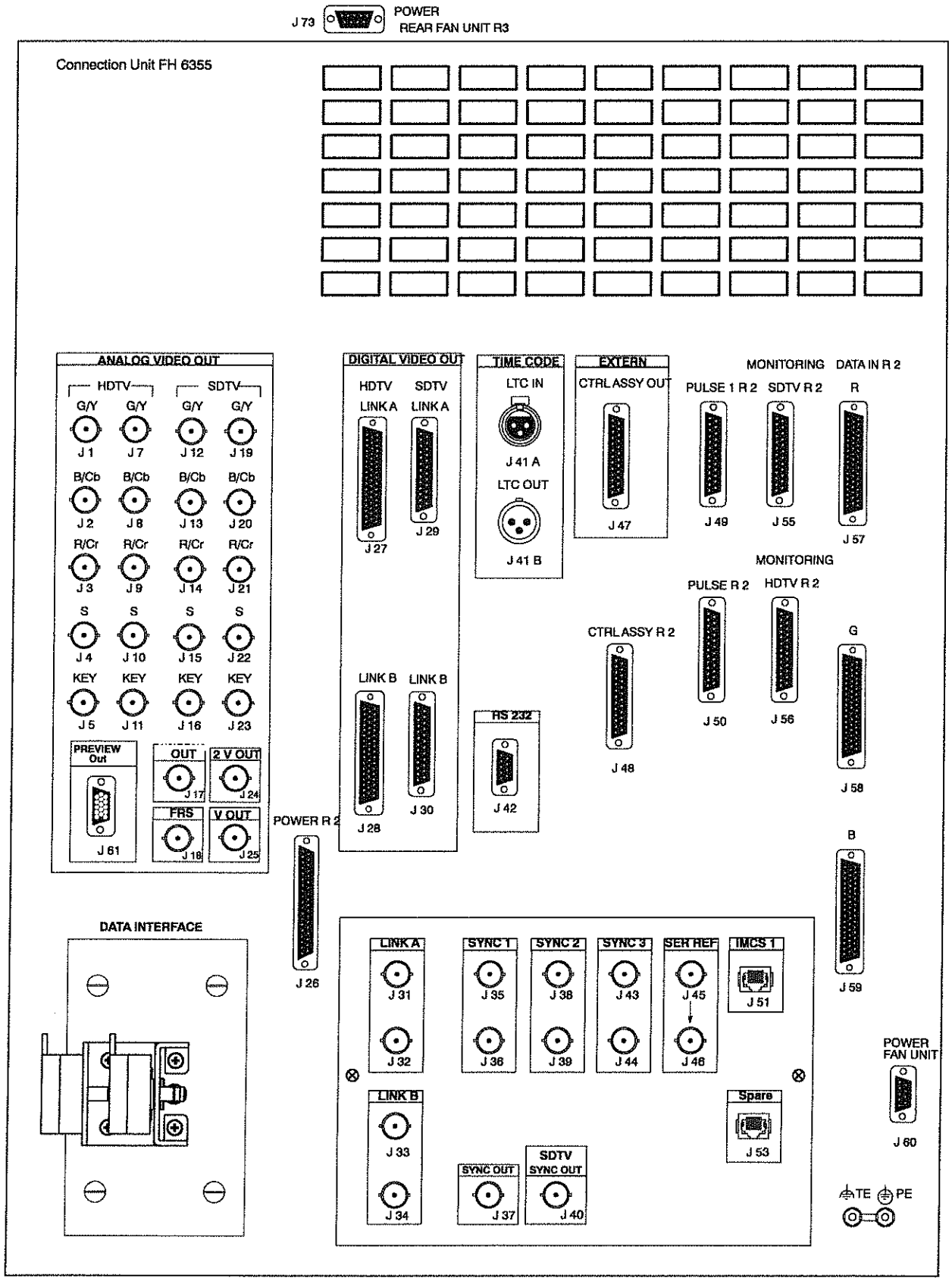
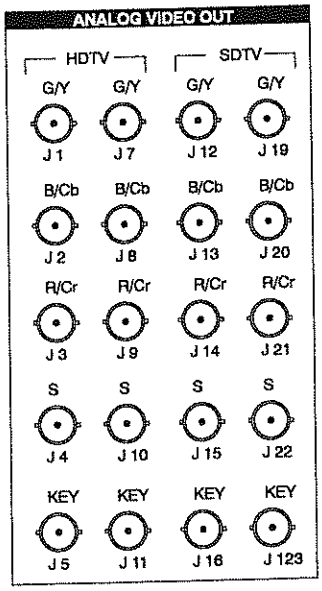


Fig. 526: Connection Unit FH 6355

5.5.1 ANALOG VIDEO OUT

(HDTV output only with option FH 1675)


ANALOG VIDEO OUT
HDTV
SDTV
G/Y G/Y G/Y G/Y
J 1 J 7 J 12 J 19
B/Cb B/Cb B/Cb B/Cb
J 2 J 8 J 13 J 20
R/Cr R/Cr R/Cr R/Cr
J 3 J 9 J 14 J 21
S S S S
J 4 J 10 J 15 J 22
KEY KEY KEY KEY
J 5 J 11 J 16 J 123

HDTV & SDTV

2 x 5 BNC connectors

R, G, B, S, K, switchable to Y, C_B, C_R, S, K independent of the digital output

SYNC signal in G-, Y-channel, switchable ON/OFF

SYNC signal in R-, B-, C_R-, C_B-channel, switchable ON/OFF

Always 4x4 output EDTV/SDTV resolution.

In 8:4:4 mode EDTV 4x4 resolution.

Fig. 527: On Terminal Panel FH 6319 (Rack 3)

ANALOG VIDEO OUT

All these BNC are outputs of analog picture signals.
The analog blanking width is corresponding to the SMPTE or CCIR defined values.
For all analog outputs it is possible to switch off the blanking (menu VIDEO).
For the luminance –, the key - and the green signal it is possible to switch transparency in the vertical blanking for a stamped-in VITC signal (menu VIDEO).

Signal level (+ sync):	0.7 V_{PP} (+ 0.3 V_{PP})
Impedance:	75 ohm
Return loss:	> 35 dB min.
Sync level:	4 V_{PP} for SDTV (Bilevel), ± 0.3 V for HDTV (Trilevel),
Impedance:	75 ohm
Return loss:	> 26 dB min.

R, G, B, S and K outputs for SDTV operating

G, J12, J19	Green component
B, J13, J 20	Blue component
R, J14, J 21	Red component
K, J16, J 23	Key signal

Component output signals for SDTV operating

Y, J12, J19	Luminance signal
C_B, J13, J20	Blue color difference signal
C_R, J14, J21	Red color difference signal
S, J15, J22	Bilevel synchronization signal 4 V_{PP}

R, G, B, S and K outputs for HDTV operating

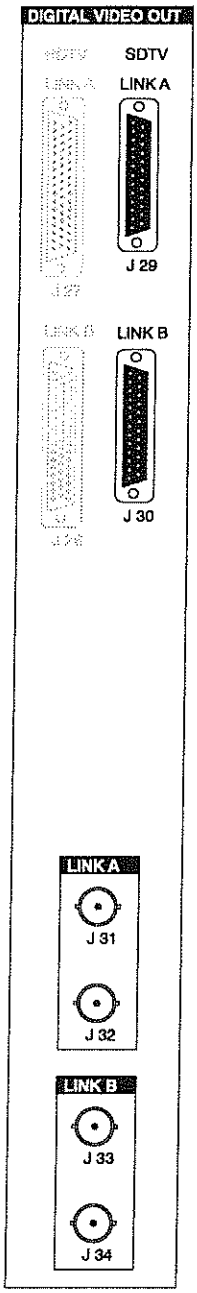
G, J1, J7	Green component
B, J2, J8	Blue component
R, J3, J9	Red component
S, J4, j10	Trilevel synchronization signal
K, J5, J11	Key signal

Component output signals for HDTV operating

C_B, J1, J7	Blue color difference signal
C_R, J2, J8	Red color difference signal
S, J3, J9	Trilevel synchronization signal
Y, J4, J 10	Luminance signal

5.5.2 DIGITAL VIDEO OUT

5.5.2.1 SDTV (EDTV / 8:4:4)*



STDV (EDTV / 8:4:4)*

STDV (EDTV / 8:4:4)*

Fig. 528:

SDTV / EDTV parallel data

SDTV OUT	D sub 25-pin female connector
LINK A, B	Link A / B
J29, J30	SDTV 4:2:2 CCIR 656 or 4x4 format (EDTV / 8:4:4)*

Digital video outputs for the SDTV Data feed to any other 4:4:4(:4) SDTV signal processor like noise reducer or color corrector.

*= prepared

Operation mode switchable, same mode at serial and parallel outputs.

Same matrix on serial and parallel outputs: R, G, B, K or Y, C_B, C_R, K

Switchable between 10 bit and 8 bit with static rounding

LINK A (parallel data) J 29

- 4:2:2 CCIR 656, Y , C_B / C_R
  or
- 4x4, Y , C_{B0} / C_{R0}
  or
- 4x4, G , B_0 / R_0
  or
- 8:4:4, Y_0, C_{B0} / C_{R0}
- 4:2:2:4 Y, C_B, / C_R

LINK B (parallel data) J30

- 4:2:2·CCIR 656 Y , C_B / C_R
  or
- 4x4 K , C_{B1} / C_{R1}
  or
- 4x4 K , B_1 / R_1
  or
- 8:4:4· Y_1 , C_{B1} / C_{R1}
  or
- 4:2:2:4 K, 0/0

SDTV / EDTV CCIR 656 serial data

LINK A J 31, J 32 (serial data)

2x BNC,
Serial 270/360 Mbit/s, CCIR 656

EBU TECH 3267-E
EBU TECH 3268-E
SMPTE T14.22

LINK B J 33, J 34 (serial data)

2x BNC, Serial 270/360 Mbit/s, CCIR 656

EBU TECH 3267-E
EBU TECH 3268-E
SMPTE T14.22

5.5.2.2 HDTV OUT Parallel

(Only with option FH 1675 HDTV Output)

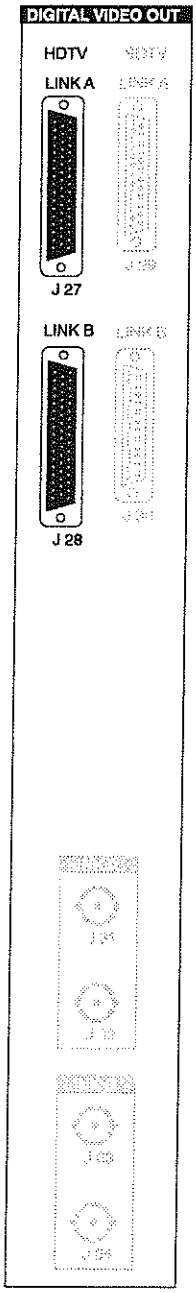


Fig. 529:

HDTV parallel video data

HDTV OUT LINK A / B D sub 50-pin female connector

Operation mode switchable
- 2x 4:2:2
- 4x4
- 4:2:2:4, Key signal on Link B

R, G, B, K or Y, C_B, C_R, K

Switchable between 10 bit and 8 bit with static rounding

Clock and data timing according to CCIR or EU 95

Pinning according to CCIR TG11

Cable adapter for EU 95, SMPTE 260M and SMPTE 274M necessary

CCIR LINK A
J 27

D sub 50-pin

4:2:2	**Y, C_B / C_R**
or	
4x4	Y, C_{B0} / C_{R0}
or	
4x4	G, B_0 / R_0
or	
4x4	G, R
or	
4:2:2:4	Y, C_B / C_R

CCIR LINK B
J 28

D sub 50-pin

4:2:2	**Y, C_B / C_R**
or	
4x4	K, C_{B1} / C_{R1}
or	
4x4	K, B_1 / R_1
or	
4x4	K, B
or	
4:2:2:4	K, 0/0

CCIR Link A/B
Y, C_B, C_R
J 27 / 28

50-pin Cannon female.
Digital parallel interface, pinning according to CCIR Document TG 11/1-11/2 for the **HDTV Y/C Signal 4:2:2**.

DATA0...DATA9 (MSB)	used for the Luminance Signal Y
DATA10...DATA19 (MSB)	used for the Chrominance Signal C_R C_B

(8/10-bit mode switchable)

Coding & Data format

Details of the video data connector CCIR Y/C

TV Standard	Coding + Data format	Clock
1250/50	CCIR TG 11/1-11/2 or EU 95-PG02/03	36 MHz
1125/60	SMPTE 260M	74.25 MHz
1125/59.94	SMPTE 260M	74.18 MHz
1920 x 1080 / 50 2:1 *	SMPTE 274M	74.25 MHz
1920 x 1080 / 59.94 / 2:1	SMPTE 274M	74.18 MHz
1920 x 1080 / 60 / 2:1	SMPTE 274M	74.25 MHz
1920 x 1080 / 23.98 P *	SMPTE 274M	74.18 MHz
1920 x 1080 / 24 P *	SMPTE 274M	74.25 MHz
1920 x 1080 / 25 P *	SMPTE 274M	74.25 MHz
1920 x 1080 / 23.98 sF *	SMPTE 274M	74.25 MHz
1920 x 1080 / 24 sF *	SMPTE 274M	74.25 MHz
1280 x 720 / 59.94 P *	SMPTE 296M	74.18 MHz
1280 x 720 / 60 P *	SMPTE 296M	74.25 MHz
* = only with option DTV FH 1635		

Pin assignment

The 20 bits in each data word for the **1250/1125 -1920x1080** signals are denoted data 00 to 19.

Data 19 is the MSB (most significant bit) of the color difference data while data 09 is the MSB of the luminance data.

The electrical specifications of the Video Data I/O connector are identically to EU-95 standard.
Mechanical pinning according to CCIR Documentation TG 11/1 - TG 12/1, is made as follows:

Contact	Bit no.	Signal	Contact	Bit no.	Signal	Contact	Bit no.	Signal
1	-	clk a				34	-	clk b
2	19	data 09a	18	-	gnd	35	19	data 09b
3	18	data 08a	19	-	gnd	36	18	data 08b
4	17	data 07a	20	11	data 01a	37	17	data 07b
5	16	data 06a	21	11	data 01b	38	16	data 06b
6	15	data 05a	22	10	data 00a	39	15	data 05b
7	14	data 04a	23	10	data 00b	40	14	data 04b
8	13	data 03a	24	-	gnd	41	13	data 03b
9	12	data 02a	25	-	gnd	42	12	data 02b
10	9	data 19a	26	-	gnd	43	9	data 19b
11	8	data 18a	27	-	gnd	44	8	data 18b
12	7	data 17a	28	1	data 11a	45	7	data 17b
13	6	data 16a	29	1	data 11b	46	6	data 16b
14	5	data 15a	30	0	data 10a	47	5	data 15b
15	4	data 14a	31	0	data 10b	48	4	data 14b
16	3	data 13a	32	-	gnd	49	3	data 13b
17	2	data 12a	33	-	gnd	50	2	data 12b

Fig. 530: Pinning of Data I/O Connector CCIR Y/C

5.5.2.3 HDTV OUT Serial

(Only with option FH 1675 HDTV Output)

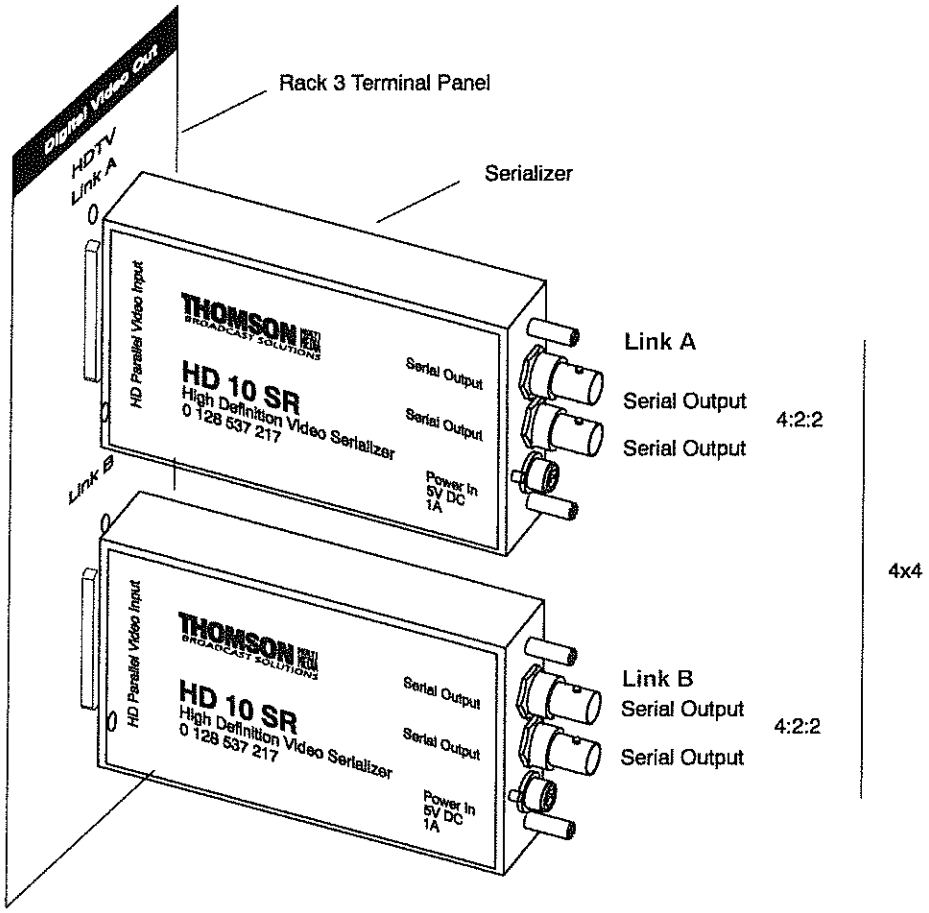


Fig. 531:

HDTV serial video data

HD SDI Video Out
According to SMPTE - 292M,
1.485 and 1.485/1.001 Gb/s

HDTV Outputs

Operation mode switchable
- 2x 4:2:2
- 4x4
- 4:2:2:4, Key signal on Link B

R, G, B, K or Y, C_B, C_R, K

Switchable between 10 bit and 8 bit with static rounding

CCIR LINK A 2x BNC 75Ω

4:2:2	**Y, C_B / C_R**
or	
4x4	Y, C_{B0} / C_{R0}
or	
4x4	G, B_0 / R_0
or	
4x4	G, R
or	
4:2:2:4	Y, C_B / C_R

CCIR LINK B 2x BNC 75Ω

4:2:2	**Y, C_B / C_R**
or	
4x4	K, C_{B1} / C_{R1}
or	
4x4	K, B_1 / R_1
or	
4x4	K, B
or	
4:2:2:4	K, 0/0

HDTV standards

- 1280 x 720 / 60 Hz progressive
- 1280 x 720 / 59.94 Hz progressive
- 1920 x 1080 / 24 Hz progressive
- 1920 x 1080 / 23.98 Hz progressive
- 1920 x 1080 / 25 Hz progressive
- 1920 x 1080 / 24 segmented frame
- 1920 x 1080 / 23.98 segmented frame
- 1920 x 1080 / 50 interlaced 2:1
- 1920 x 1125 / 60 interlaced 2:1
- 1920 x 1125 / 59.94 interlaced 2:1
- 1920 x 1080 / 60 interlaced 2:1
- 1920 x 1080 / 59.94 interlaced 2:1

Restrictions
1920 x 1250 / 50 interlaced 2:1 is not supported.

5.5.3 SYNC PULSE OUTPUTS

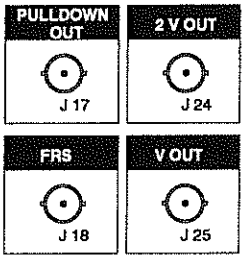


Fig. 532:

Pulldown Out "film scanner Frame Pulse" for a key code reader/ time code reader / generator
J17 TTL level (see figure 518)
BNC connector

FRS The FRS (Freeze Signal) is used to mark repeated fields
J18 TTL level
BNC connector

2 V Out TTL pulse for test and alignment
J24 BNC connector

V Out TTL pulse for test and alignment
J25 BNC connector

5.5.4 EXTERNAL REFERENCE INPUTS

For synchronization of the film scanner.

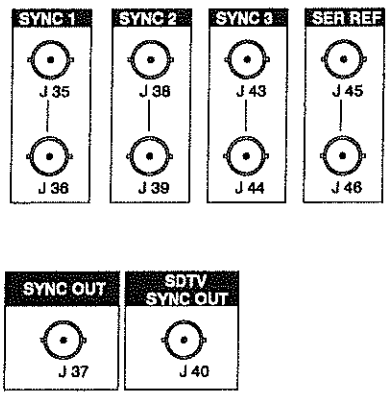


Fig. 533:

SYNC 1, J35, J36 Loop input 1 for an analog studio reference

	SDTV: bilevel HDTV: trilevel	0.3 V_{pp}- 4 V_{pp} 0.6 V_{pp}
	BNC connector	
SYNC 2, J38, J39	Loop input 2 for an analog studio reference	
	SDTV: bilevel HDTV: trilevel	0.3 V_{pp} - 4 V_{pp} 0.6 V_{pp}
	BNC connector	
SYNC 3, J43, J4	Loop input 3 for an analog studio reference	
	SDTV: bilevel HDTV: trilevel	0.3 V_{pp} - 4 V_{pp} 0,6 V_{pp}
	BNC connector	
SER REF J45, J 46	4:2:2 serial, 270 Mbit/s (CCIR 656) ECL Level 270 MHz	 800 mV

The Sync input is selected by the control panel menu Home - submenu Setup, "Genlock Settings", "Genlock Ref Sync".

Note!
For external synchronization of the Spirit DataCine an appropriate sync signal has to be provided.
In case of SDTV standards an analog bilevel SDTV - sync signal or a serial digital SDI - signal are applicable.

Synchronization of HDTV

For (H)DTV applications an analog trilevel (H)DTV - sync has to be applied. This external sync signal must be fully compliant to the selected (H)DTV standard.

Note!
Synchronization of (H)DTV operating modes to SDTV sync signals is not supported (not possible).
For example, the V sync of the 625/50 standard can not be used in the Spirit DataCine for synchronizing the (H) DTV standard 1920 x 1080 **25p.**

SYNC OUT, J37

Sync output reflects the level of the selected EXT REF signal SYNC 1 - 3.
BNC female.

SDTV SYNC OUT J40

Bilevel SDTV sync pulse 625 / 525 also in HDTV, DTV and data mode

Unterminated	4 V_{pp}
Terminated with 75 Ω	2 Vpp

Especially designed for the vertical synchronization of telecine controllers.

Special SDTV Sync Out 651 lines

The signal pattern only depends on the frame rate of the selected video standard.

VIDEO STANDARD	SDTV SYNC OUTPUT J40
All 25 / 50 Hz systems	625 lines SDTV-sync with 50 Hz field rate
All 30 / 60 Hz systems	525 lines SDTV-sync with 60 Hz field rate
All 29.97 / 59.94 Hz systems	525 lines SDTV-sync with 59,94 Hz field rate
All 24 Hz systems	651 lines SDTV-sync with 48 Hz field rate
All 23.98 Hz systems	651 lines SDTV-sync with 47.95 Hz field rate

A detailed description of the artificial 651 lines sync pattern is given in Appendix B of the manual "FH 1635 Option DTV" FU 0082.

5.5.5 TIME CODE

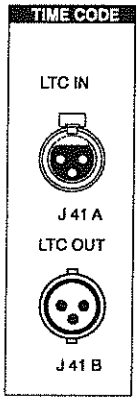


Fig. 534:

5.5.5.1 XLR female connector LTC IN (for future use)

LTC In *J 41A*	XLR input connector Interface for ARRI film time code information

5.5.5.2 XLR male connector LTC OUT)

LTC Out *J 41B*	LTC (linear timecode) kompatible to the standard SMPTE 12M. XLR connector

5.5.6 CONTROLS

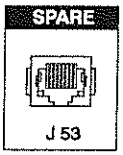


Fig. 535: Part of the Connection Unit FH 6325 (Rack 3)

Socket / Connector Description	Socket type Connector type	Function
J 53 Spare	RJ45 connector	(for future use)

5.5.7 IMCS 1

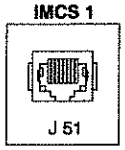


Fig. 536: Part of the Connection Unit FH 6325 (Rack 3)

Socket / Connector Description	Socket type Connector type	Function
J 51 iMCS 1	RJ45 connector	This RJ45 connector is used to extend the iMCS 1 - bus for connecting Functional Control Panel, Diagnostic PC or / and telecine controller. Details about the standard see chapter 10.1 "Interfaces - imcs".

5.5.8 RS 232 I. F.

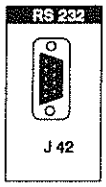


Fig. 537:

RS 232
J 42

Serial RS 232 interface port for test and alignment purposes.

5.5.9 EXTERN

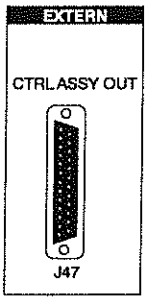


Fig. 538:

Ctrl Assy Out
J47

Daisy chain
Connection to external Philips Racks.

5.5.10 DATA INTERFACE (FH 6335 HIPPI SERIAL INTERFACE)

FH 6335 is part of option TE 2150 Transfer Engine Package

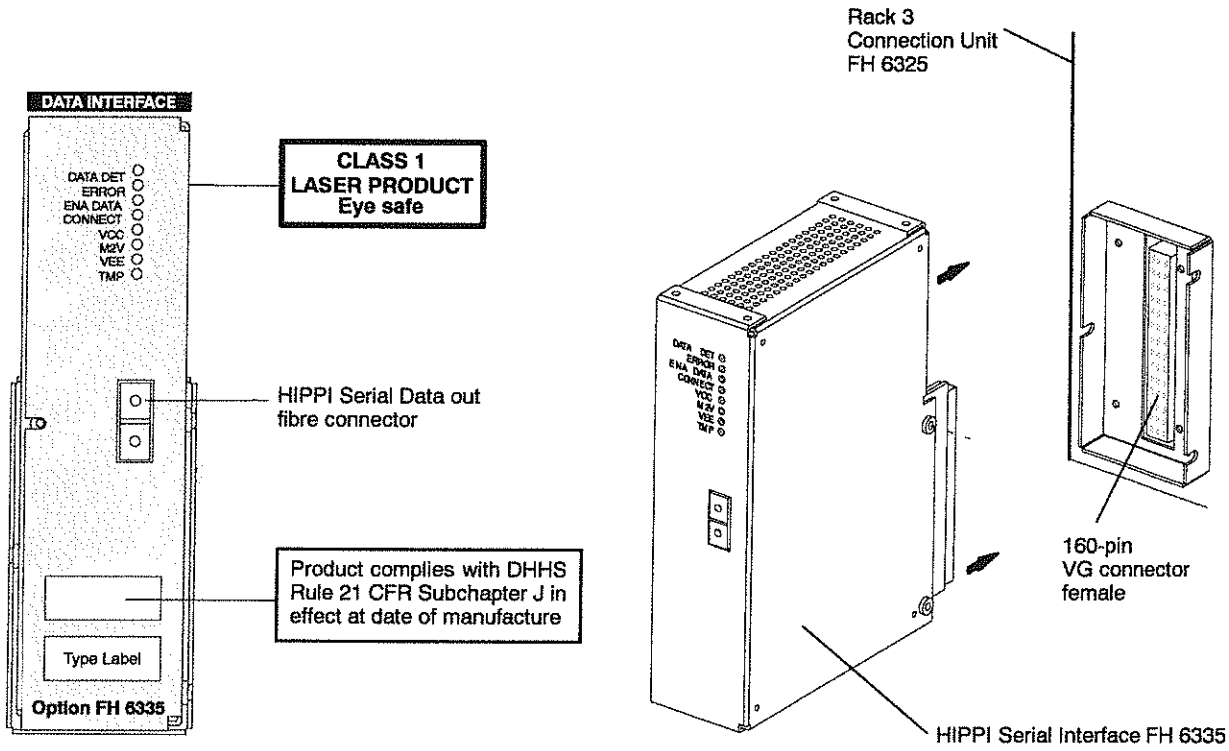


Fig. 539: Part of the Connection Unit FH 6325 (Rack 3)

Socket / Connector Description	Socket type Connector type	Function
Serial Data out	Fibre connector female	It provides a means of high-speed data transmission via a pair of fiber optic cables. The Serial Interface is intended to be used for cable lengths up to 500 m. Multi-Mode Fiber Cable Manufacturer: ***AMP*** *Order No.: 349565 SC - Duplex* Cable: Type: 50/125 µm MMF Length: max. 500 m Bandwidth: min. 500 MHz *km @ 780 nm Optical loss: max. 4 dB / km Connectors: Type: SC duplex Mean loss: max. 0.11 dB Standard deviation loss: 0.15 dB Optical return loss: min. 20 dB Number of connectors: max. 8 between two transceivers

5.5.11 GSN DATA INTERFACE

Option TE 2111 / TE 2111HG GSN TransferEngine

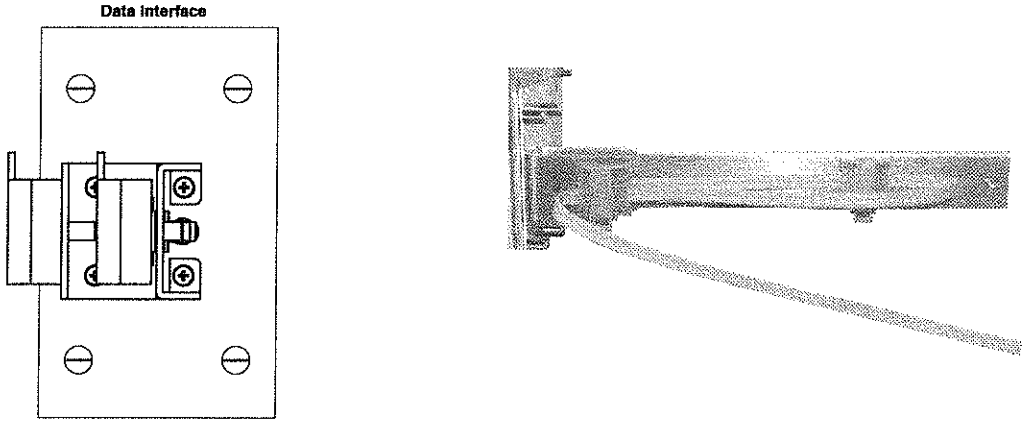


Fig. 540: Part of the Connection Unit FH 6355 (Rack 3)

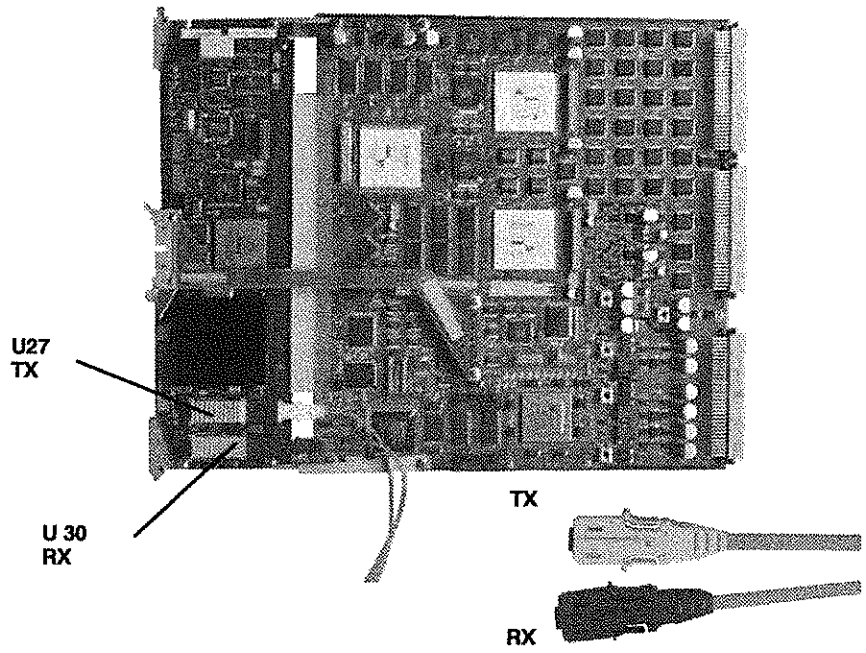


Fig. 541: GSN I.F. Board FY 6385

Socket / Connector Description	Socket type Connector type	Function
GSN Optical Connection TX - RX	Two connectors: 12 Fiber MPO each	It provides a means of high-speed data transmission via a GSN optical cable. The GSN Interface is intended to be used for cable lengths up to 200 m. GSN optical cable 25 m standard length is part of the Option GSN Phantom TransferEngine TE 2111 / TE 2111 HG

5.6 IMCS CONNECTIONS (RJ45)

The Ethernet 10Base-T Micro HUB is mounted in the rear of the filmdeck over the racks 2 and 3. The Micro HUB is internally connected with the iMCS RJ 45 connectors of the racks 1 - 3. External devices have to be connected via the four RJ45 connectors of the terminal panel.

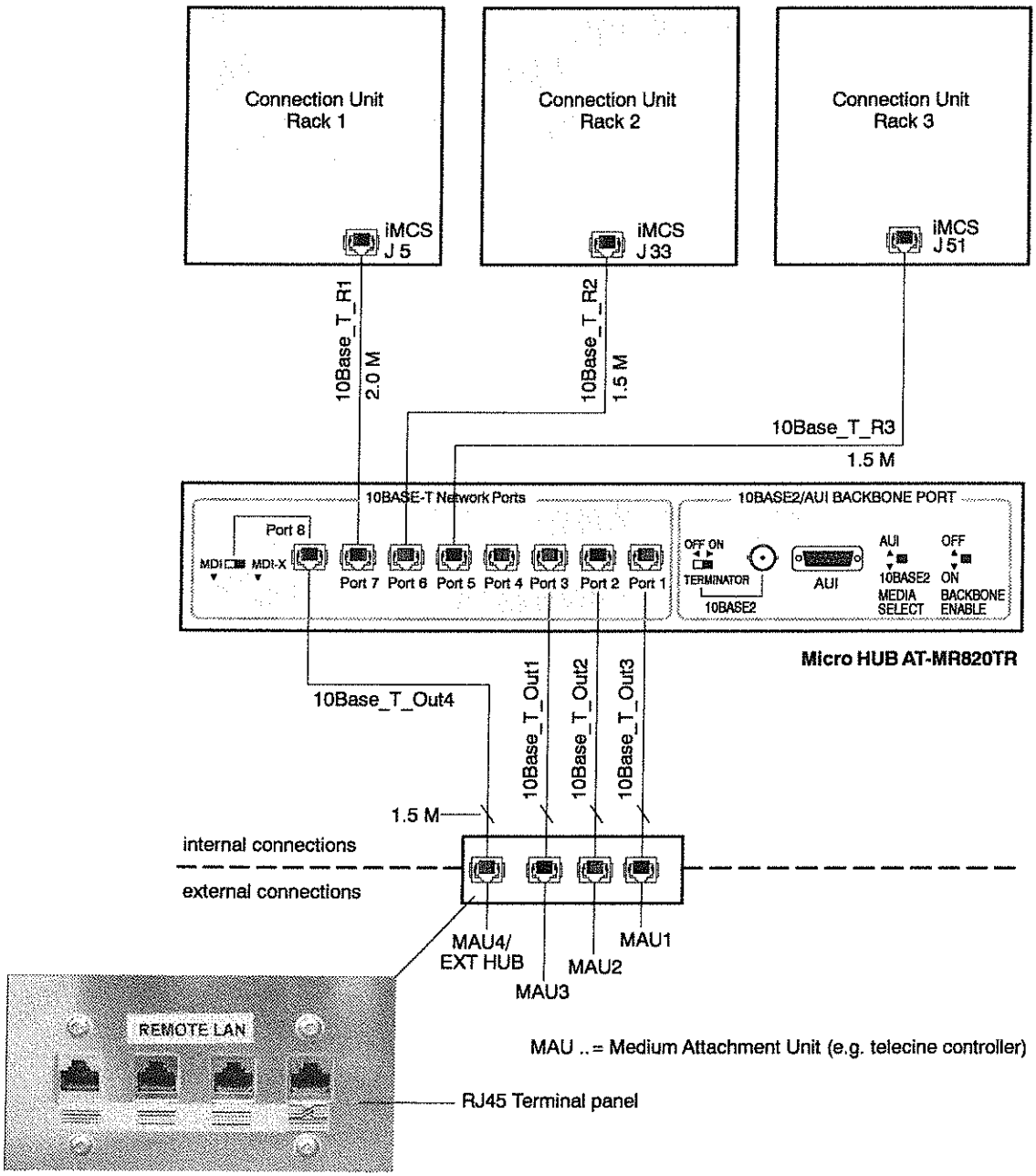


Fig. 542: Internal and external RJ45 connections

On the Micro HUB AT-MR820TR there is also a **10Base2** port (BNC connector) available.

Important 50 Ω terminator settings!

10Base2 port unconnected

- If the 10Base2 port (BNC connector) is not used, switch the TERMINATOR to "**ON**" and plug in an additional 50 Ω terminator.
  Otherwise the internal communication via the HUB could be disturbed.

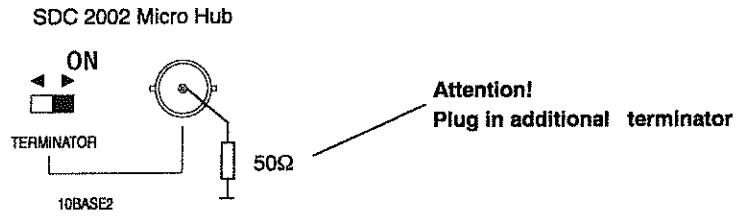


Fig. 543:

10Base2 port as one bus end connected

- If this connector will be used and realized as one end of the external iMCS bus, e.g. for a telecine controller, make sure that the port is terminated (50 Ω at each side).
  Set TERMINATOR switch to "**ON**". Also switch MEDIA SELECT and BACK-BONE ENABLE to "**ON**".

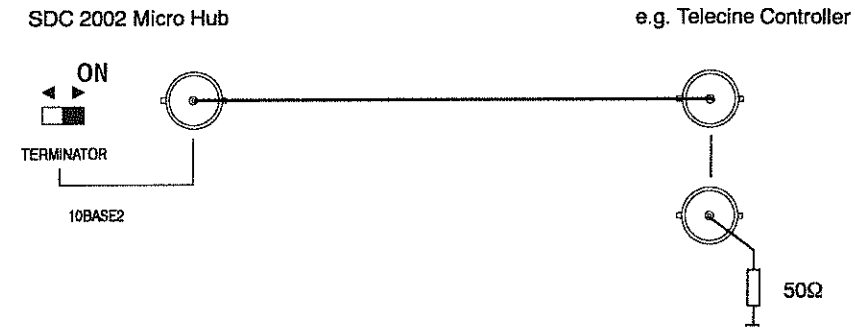


Fig. 544:

10Base2 port via BNC T-connector connected

- In case the 10Base2 port is is used as part of a iMCS bus via a BNC T-connector (e.g. for a service PC with SDCMAINT) then set TERMINATOR to "**OFF**".

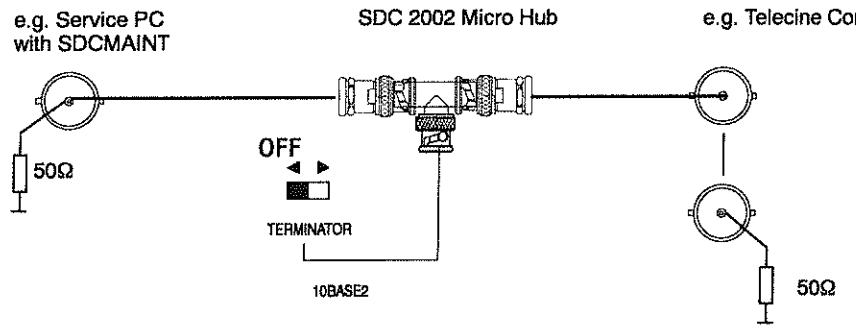


Fig. 545:

Note!
If an additional external HUB is connected, set MDI/MDI-X switch on internal HUB to MDI-X or use crossed RJ45 patch cable.

6. OPERATIONAL CONTROLS

This section describes switches, testpoints and LEDs of boards within Racks 1-3.

6.1 RACK 1 FILM SCANNING AND AUDIO PROCESSING

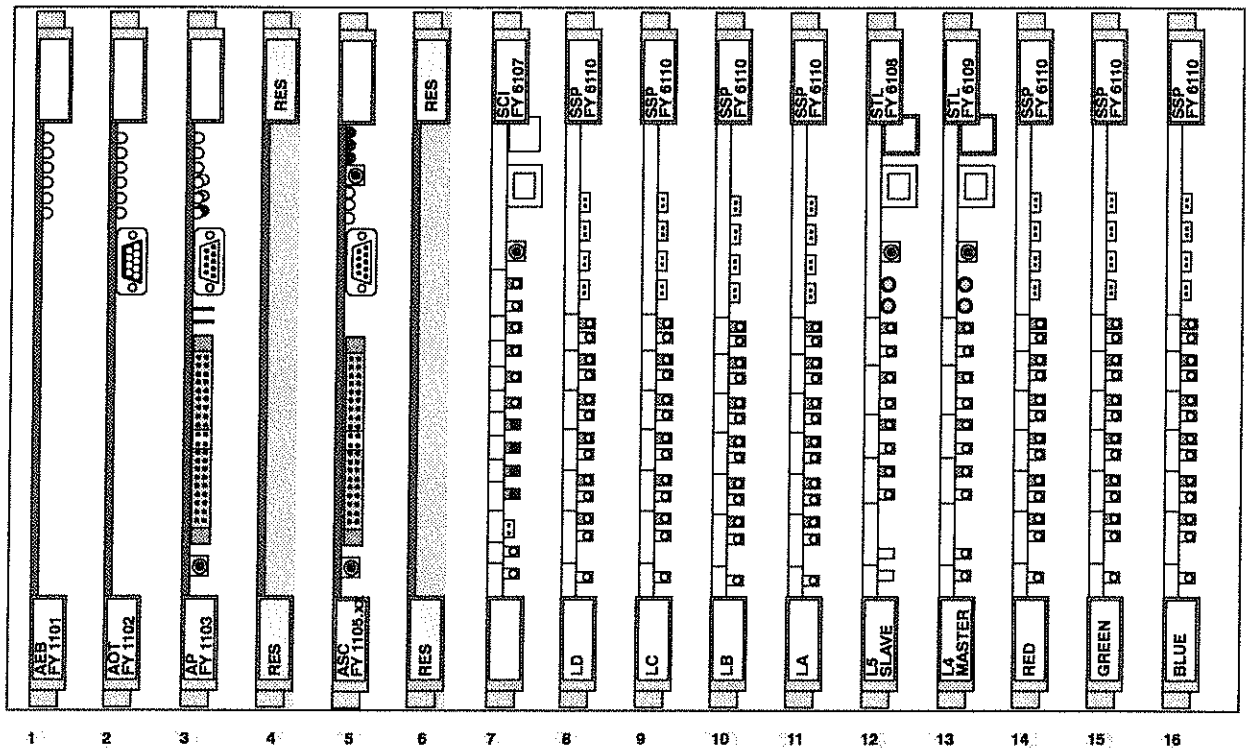


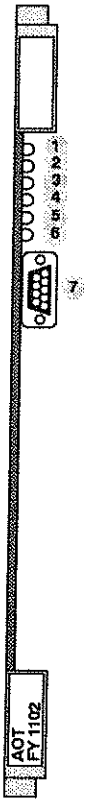
Fig. 600:

1. FY 1101	Audio Equalizer
2. FY 1102	Audio Output
3. FY 1103	Audio Processor
4. Reserve	
5. FY 1105.xx	Analog Signal Control
6. Reserve	
7. FY 6107	Illumination Control Interface
8. FY 6110	Signal Processor Luminance D
9. FY 6110	Signal Processor Luminance C
10. FY 6110	Signal Processor Luminance B
11. FY 6110	Signal Processor Luminance A
12. FY 6108 L5 Slave	High Speed Logic Board Luma
13. FY 6109 L4 Master	High Speed Logic Board Chroma
14. FY 6110	Signal Processor RED
15. FY 6110	Signal Processor GREEN
16. FY 6110	Signal Processor BLUE

6.1.1 AUDIO EQUALIZER FY 1101

1 - 6 LEDs (6x green): +12V; +8.25V; +5V; -5V; -8.25V; -12V

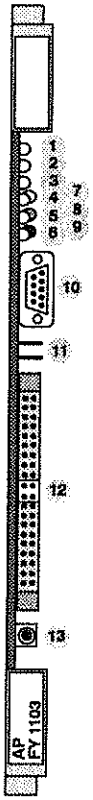
6.1.2 AUDIO OUTPUT FY 1102



1 - 6 LEDs (6x green): +15V; +8.25V; +5V; -5V; -8.25V; -15V

7 Interface (9 pole, male): AES/EBU digital audio test input

6.1.3 AUDIO PROCESSOR FY 1103



1 - 6 LEDs (6x green): +12V; +8.25V; +5V; -5V; -8.25V; -12V

7 - 9 LEDs (green, yellow, red): proc. ctrl. indicators
green: no errors (red: OFF)
yellow: monitor program started (service)
red: pwr. up test err. or online err. (green: OFF)
green ON/red flashing: warnings
(level overflow, data transmission etc.)

10 Interface (9 pin, female): RS232 interf. for serv. terminal

11 Measuring points: M 14 / M 15, proc. reset (shortcircuit)

12 Interface (40 pin, male): testpoint signals out

13 Service button: internal test tone gen. ON (1 kHz / 0 VU)

6.1.4 ANALOG SIGNAL CONTROL FY 1105

1 - 3 LED (red) ON: Standby for racks 2, 3, 4

4 Button 1: reset for MCK (microcomputer kernel)

5 - 7 LEDs (green) ON: VCC; M2V; VEE (+5V; -2V; -5V)

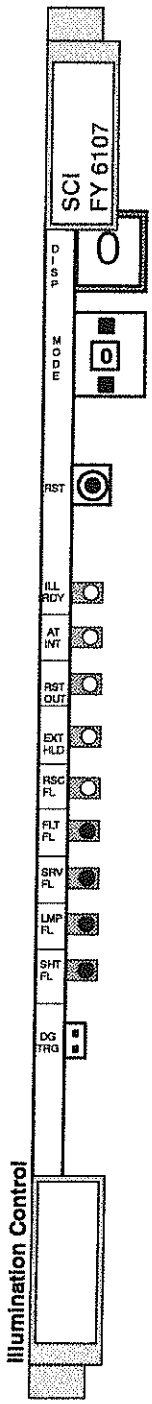
8 Interface (9 pin, female): RS232 interf. for serv. terminal

9 Interface (40 pin, male): testpoint signal out

10 Button 2: test for MCK

hold **button 2** and press **button 1**: starts MCK mon. progr. (service)

6.1.5 ILLUMINATION CONTROL BOARD FY 6107



MODE switch & display: not enabled, for board level test

RST button: reset for AIH (analog image head), clears failure registers

ILL RDY LED (green): illumination ready, light level achieved, board ready

AT INT LED (green): light at intensity, feedback loop is running

RST OUT LED (green) ON: board in reset

EXT HLD LED: Extern (ASC) hold processing

RSC FL LED (red): RSCI time out, data transmission failure

FLT TO LED (red) ON: filter wheel time out

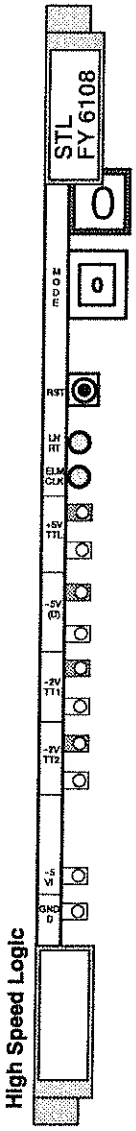
SRV FL LED (red): servo fast aperture failure

LP FL LED (red): lamp time out, ignition or overtemperature failure

SHT FL LED (red): shutter not in commanded position

DG TRG pins: trigger pulse testpoint (top)

6.1.6 HIGH SPEED LOGIC FY 6108 / FY 6109



Display: test mode display

MODE switch: man. test mode

RST button: reset board
LN RT HF socket: line rate pulse out
ELM CLK HF socket: element rate pulse out (test)

+ 5 V TTL LED (green) with socket

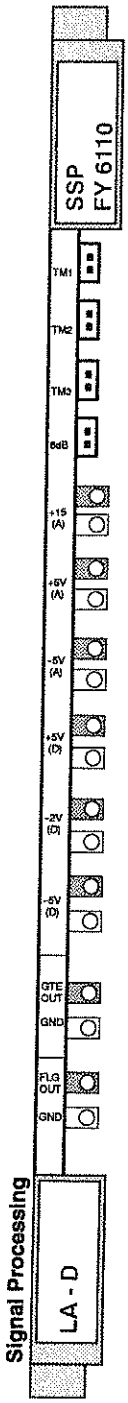
- 5 V (D) LED (green) with socket

- 2 V TT1 LED (green) with socket

- 2 V TT2 LED (green) with socket

- 5 VI socket: -5V input for -2V reg.
GND D socket: digital ground

6.1.7 SIGNAL PROCESSING FY 6110 (LA-LD & R G B)



TM1 pins 1-2: Timing Mode 1

TM2 pins 1-2: Timing Mode 2

TM3 pins 1-2: Timing Mode 3

6dB: + 6 dB Gain Mode

+ 15 V LED (green) with socket

+ 5 V (A) LED (green) with socket

- 5 V (A) LED (green) with socket

+ 5 V (D) LED (green) with socket

- 2 V (D) LED (green) with socket

- 5 V (D) LED (green) with socket

GTE OUT pin: gate trigger pulse

FLG OUT pin:

6.2 RACK 2 FILM PRE-PROCESSING

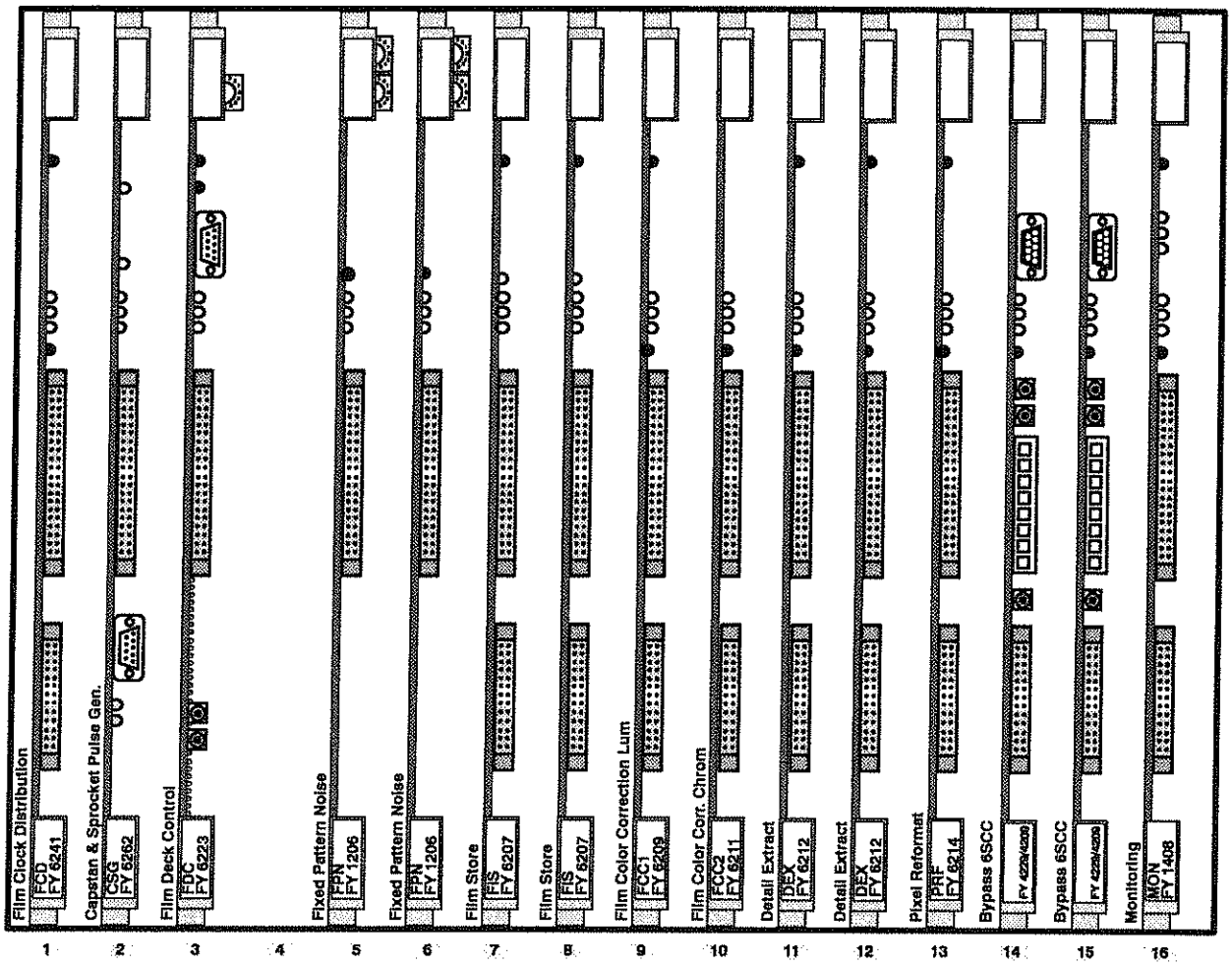
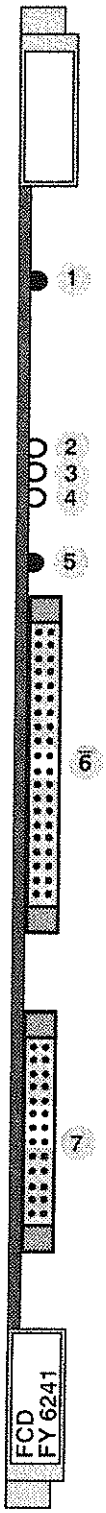


Fig. 601:

1. FY 6241.xx	Film Clock Distribution FCD
2. FY 6262.xx	Capstan & Sprocket Pulse Generator CSG
3. FY 6223.xx	Filmdeck Control FDC
4. Spare	
5. FY 1206	Fixed Pattern Noise 1 FPN
6. FY 1206	Fixed Pattern Noise 2 FPN
7. FY 6207.xx	Film Store 1 FIS
8. FY 6207.xx	Film Store 2 FIS
9. FY 6209	Film Color Correction Luminance FCC
10. FY 6211	Film Color Correction Chrominance FCC
11. FY 6212	Detail Extract 1 DEX
12. FY 6212	Detail Extract 2 DEX
13. FY 6214	Pixel Reformat PRF
14. FY 4229	Bypass 6SCC or Option FY 4209 6SCC
15. FY 4229	Bypass 6 SCC or Option FY 4209 6SCC
16. FY 1408.xx	Monitoring MON

6.2.1 FILM CLOCK DISTRIBUTION FY 6241



1 LED (red): LCA configuration

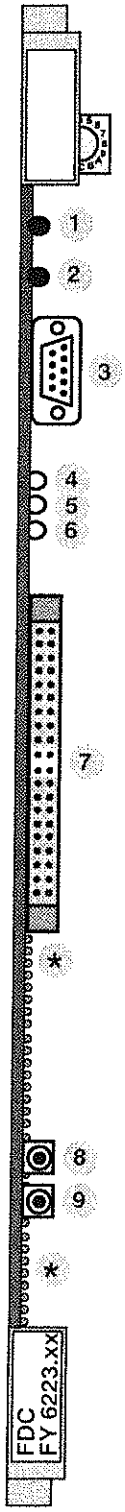
2 - 4 LEDs (3x green): VCC; M2V; VEE; (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.3 FILMDECK CONTROL FY 6223



Hex. switch 1: Position 3 = new Rack 2 for 6-Sector Color Correction

1 LED (red): LCA configuration

2 LED (red): Flash valid

3 Interface (9 pin, female): RS232 interface for service terminal

4 - 6 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

7 Interface (40 pin, male): testpoint signals out

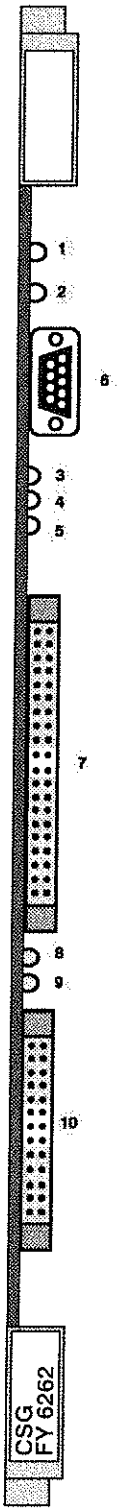
8 Button 1: reset for MCK

9 Button 2: test for MCK (micro computer kernel)

hold **button 2** and press **button 1**: starts MCK mon. progr. (service)

* **Note:**
Further LEDs on the p.c. boards, see service manual.

6.2.2 CAPSTAN & SPROCKET PULSE GENERATOR FY 6262



1 - 5 LEDs (5x green): P12V; M12V; VCC; M2V; VEE
(+12V; -12V; +5V; -2V; -5V)

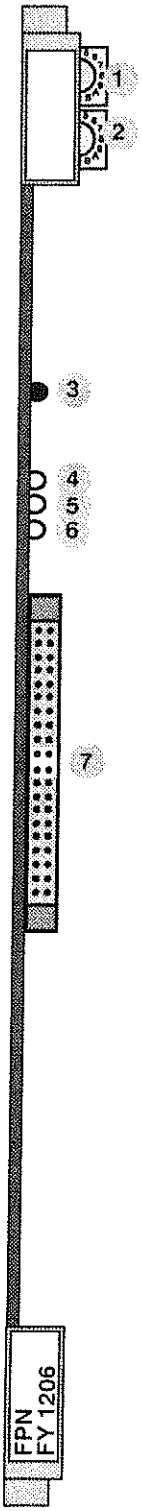
6 Interface (9 pin, female): RS232 interface for service terminal

7 Interface (40 pin, male): test point signals out

8 + 9 LEDs (2x yellow): 10 ON: capstan locked / 2V Film
11 ON: film deck ready; 2V Ref.
11 flashing: filmdeck error

10 Programmer Interface (26 pin, male)

6.2.4 FIXED PATTERN NOISE FY 1206



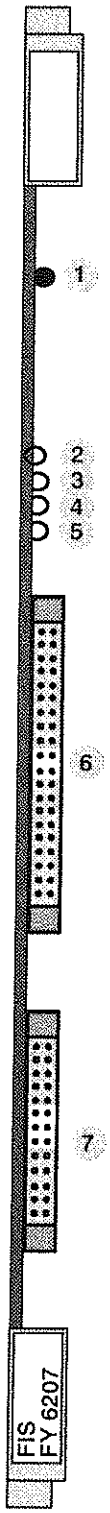
1 Hex. switch 1: LSB
2 Hex. switch 2: MSB
board version (for service use only)

3 LED (red): LCA configuration

4 - 6 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

7 Interface (40 pin, male): testpoint signals out

6.2.5 FILM STORE FY 6207



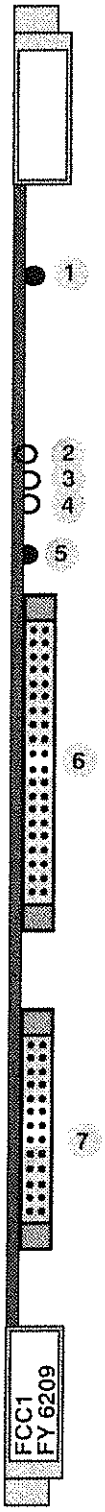
1 LED (red): LCA configuration

2 - 5 LEDs (4x green): P3V3;VCC; M2V; VEE; (+3,3V;+5V; -2V; -5V;)

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.6 FILM COLOR CORRECTION LUMINANCE FY 6209



1 LED (red): LCA configuration

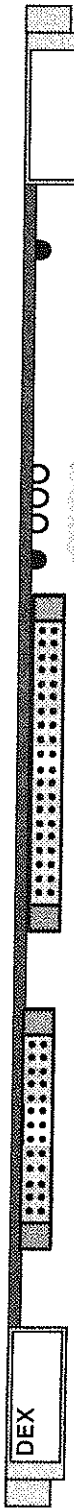
2 - 4 LEDs (4x green): VCC; M2V; VEE; (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.7 FILM COLOR CORRECTION CHROMINANCE FY 6211



1 LED (red): LCA configuration

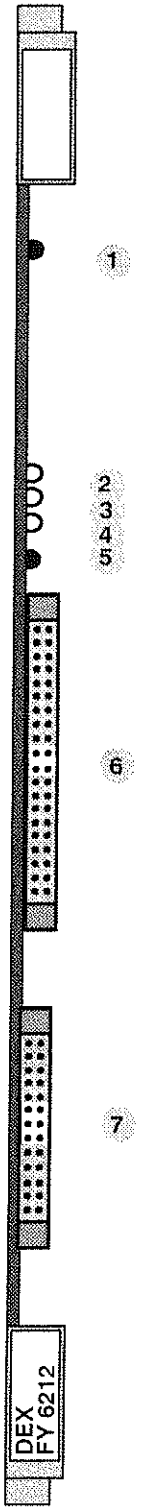
2 - 4 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.8 DETAIL EXTRACT FY 6212



1 LED (red): LCA configuration

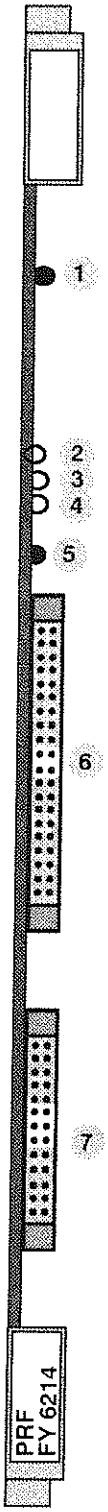
2 - 4 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.9 PIXEL REFORMAT FY 1303/6214



1 LED (red): LCA configuration

2 - 4 LEDs (4x green): VCC; M2V; VEE; (+5V; -2V; -5V)

6 LED (red): temperature warning (70°C) !

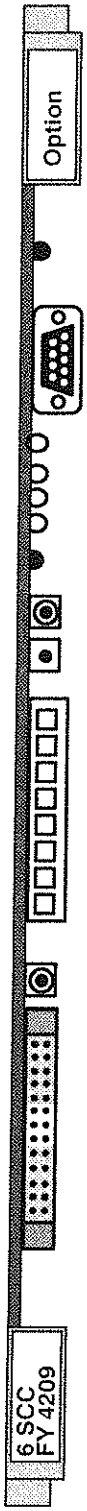
6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.2.10 FY 4229 BYPASS 6SCC

1 - 3 LEDs (4x green): VCC; M2V; VEE; (+5V; -2V; -5V)

6.2.11 FY 4209 6 SECTOR COLOR CORRECTION (OPTION IN PREPARATION)



LED (red): LCA configuration

RS 232 I.F. for terminal program

P3V3
VCC
M2V
VEE
LED (red): temperature warning (70°C) !

RESET

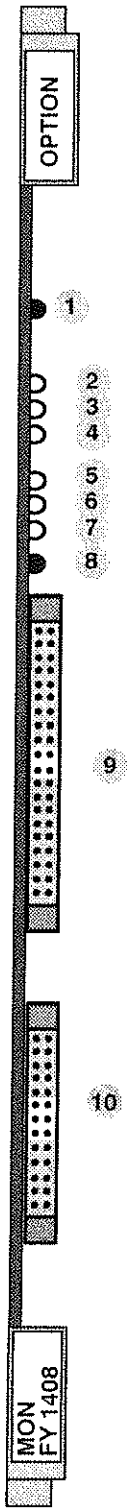
SELECT

Display: Status messages for service purposes

ENTER

Programmer Interface (26 pin, male)

6.2.12 MONITORING FY 1408



1 LED (red): LCA configuration

2 - 4 LEDs (3x green): +5V; -5V; -12V

6 - 7 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

8 LED (red): Temperature

9 Interface (40 pin, male): testpoint signals out

10 Programmer Interface (26 pin, male)

6.3 RACK 3 FILM POST-PROCESSING

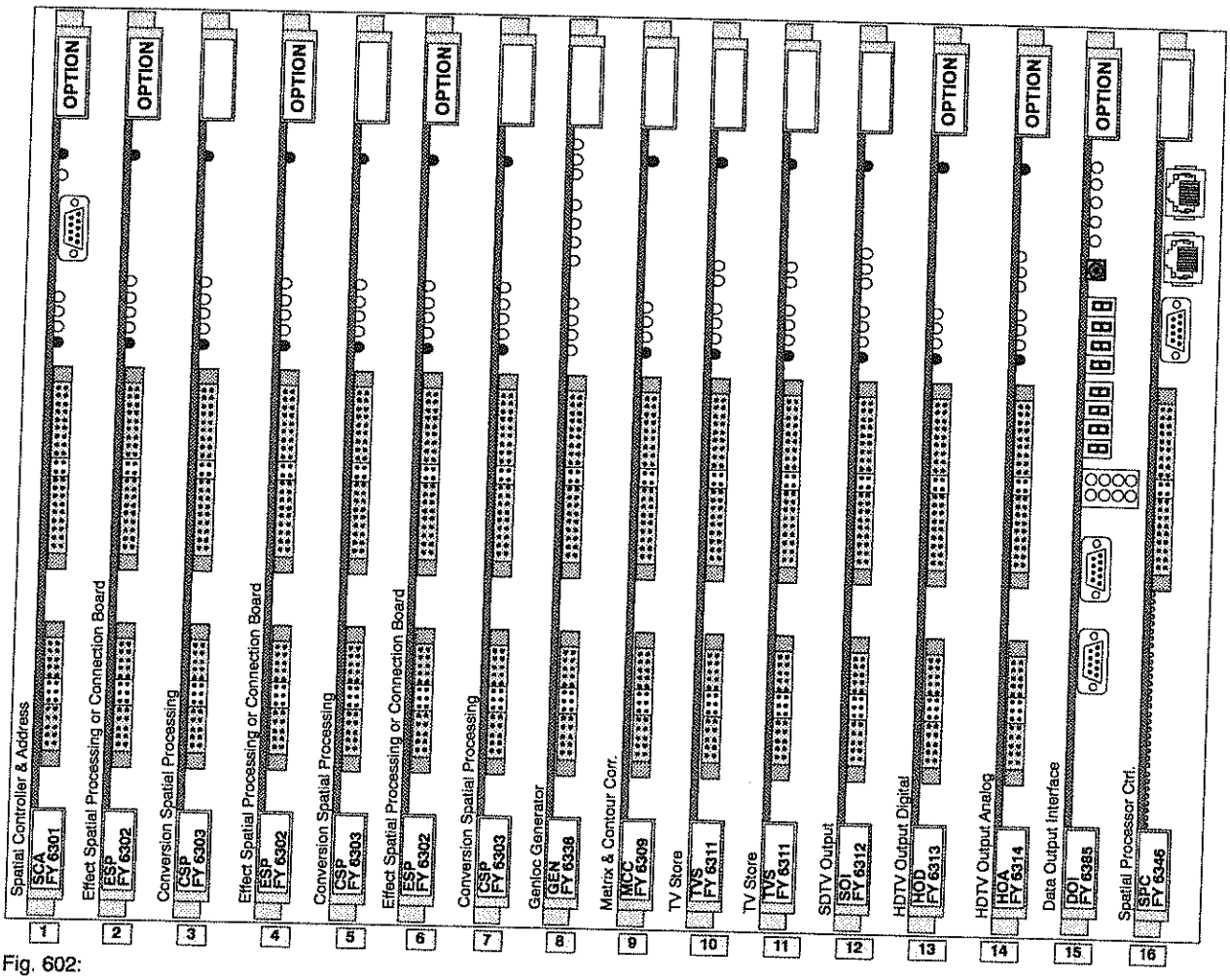
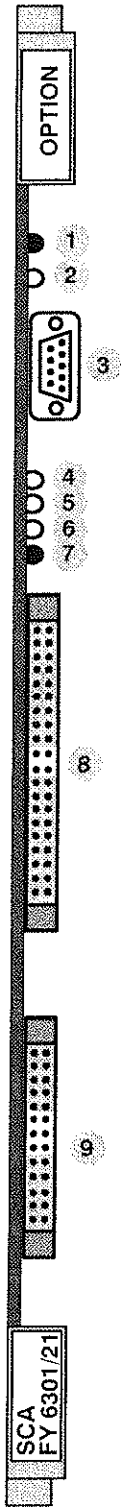


Fig. 602:

1. FY 6301.xx/FY 6321.xx Spatial Controller & Address with or w/o Rotation
2. FY 6302.xx/FM 6320 Effect Spatial Processing or Connection Board 3
3. FY 6303.xx Conversion Spatial Processing
4. FY 6302.xx/FM 6320 Effect Spatial Processing or Connection Board 3
5. FY 6303.xx Conversion Spatial Processing
6. FY 6302.xx/FM 6320 Effect Spatial Processing or Connection Board 3
7. FY 6303.xx Conversion Spatial Processing
8. FY 6338.xx Genlock Generator
9. FY 6309.xx Matrix & Contour Correction
10. FY 6310.xx TV Store
11. FY 6311.xx TV Store
12. FY 6312.xx SDTV Output
13. FY 6313.xx HDTV Output Digital
14. FY 6314.xx HDTV Output Analog
15. FY 6385.xx GSN Data Output Interface
16. FY 6346.xx Spatial Processor Control

6.3.1 SPATIAL CONTROLLER & ADDRESS FY 6301 (w. Rotaion)
SPATIAL CONTROLLER & ADDRESS FY 6321 (w.o. Rotation)



1 LED (red): LCA configuration
2 LED (green): Sync o.k.

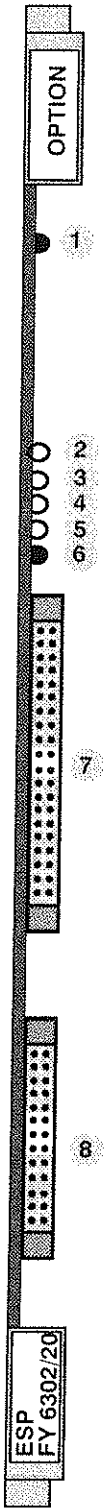
3 9 pin female: Programmer Interface RS 232 for service terminal

4 - 6 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)
7 LED (red): temperature warning (70°C) !

8 Interface (40 pin, male): testpoint signals out

9 Programmer Interface (26 pin, male)

6.3.2 EFFECT SPATIAL PROCESSING FY 6302 (w. Rotation)
Alternative Connection Board FY 6320 (w.o. Rotation)



1 LED (red): LCA configuration

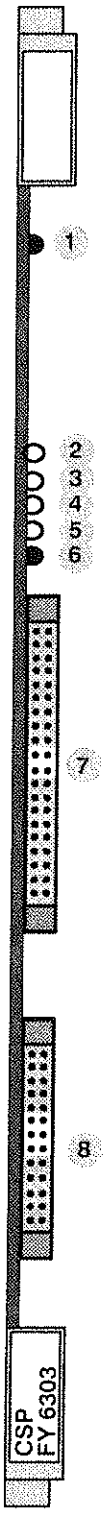
2 - 5 LEDs (4x green):+3,3V; VCC; M2V; VEE (+3,3V;+5V; -2V; -5V)

6 LED (red) temperature warning (70°C) !

7 Interface (40 pin, male): testpoint signals out (FY 6302)

8 Programmer Interface (26 pin, male) (FY 6302)

6.3.3 CONVERSION SPATIAL PROCESSING FY 6303



1 LED (red): LCA configuration

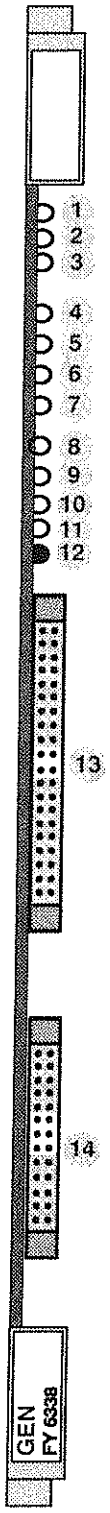
2 - 5 LEDs (4x green):+3,3V; VCC; M2V; VEE (+3,3V;+5V; -2V; -5V)

6 LED (red) temperature warning (70°C) !

7 Interface (40 pin, male): testpoint signals out (FY 6302)

8 Programmer Interface (26 pin, male) (FY 6302)

6.3.4 GENLOCK GENERATOR FY 6338



1 3 LEDs (3x yellow):

In case of internal Sync mode	In case of external Sync mode			
		G1	ON =	external Sync available
		G1	OFF =	no external Sync
OFF	ON	G2	ON =	Oscillator running
ON	ON	G2	OFF =	Error
OFF	ON	G3	ON =	Board locked to external Sync
		G3	OFF =	Board unlocked

4- 7 LEDs (4x yellow):
TV standard (encoded, LED 4 = LSB / LED 7 =MSB)

LED 7 6 5 4					
0 0 0 0	=	1920 x 1080 L /	59.94i	or	1920 x 1080 L / 25.00 P
0 0 0 1	=	525 L /	59.94 i		
0 0 1 0	=	1250 L /	50.00 i	or	1920 x 1080 L / 50.00 i
0 0 1 1	=	625 L /	50.00 i		
0 1 0 0	=	1125 L /	60.00 i	or	1920 x 1080 L / 24.00 P
0 1 0 1	=	EDTV 625 L /	50.00 i		
0 1 1 0	=	1125 L /	59.94 i	or	1920 x 1080 L / 23.98 P
0 1 1 1	=	EDTV 525 L /	59.94 i		
1 0 0 0	=	1920 x 1080 L /	60.00 i	or	1920 x 1080 L / 24.00 sF
1 0 0 1	=	625 L 8:4:4 /	50.00 i		
1 0 1 0	=	DATA MODE		or	1920 x 1080 L / 23.98 sF
1 0 1 1	=	525 L 8:4:4 /	59.94 i		
1 1 0 0	=	1280 x 720 L /	60.00 p		
1 1 0 1	=	-			
1 1 1 0	=	1280 x 720 L /	59.94 p		
1 1 1 1	=	-			

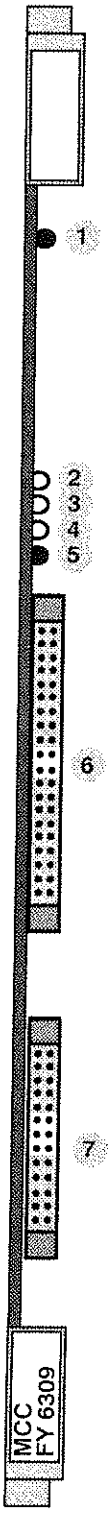
8- 11 LEDs (4x green):+15V; VCC+5V; M2V-2V; VEE -5V;

12 LED (red) temperature warning (70°C) !

13 Interface (40-pin, male): testpoint signals out

14 Programmer Interface (26-pin, male)

6.3.5 MATRIX & CONTOUR CORRECTION FY 6309



1 LED (red): LCA configuration

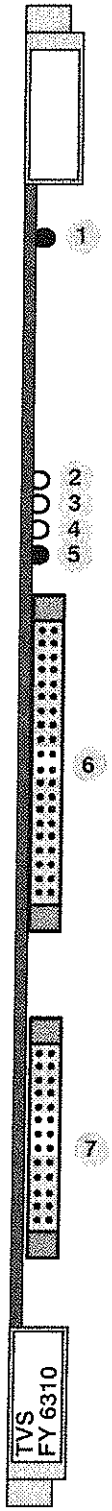
2 - 4 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.3.6 TV STORE FY 6311



1 LED (red): LCA configuration

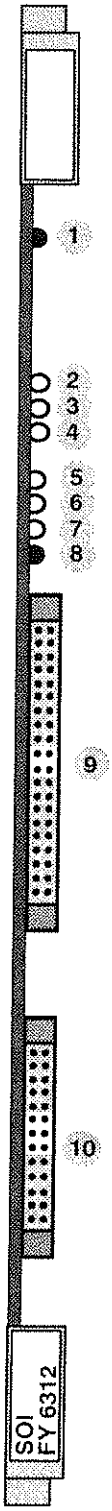
2 - 4 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

5 LED (red): temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.3.7 SDTV OUTPUT FY 6312



1 LED (red): LCA configuration

2 - 4 LEDs (3x green): analog+5V; -5V; -12V

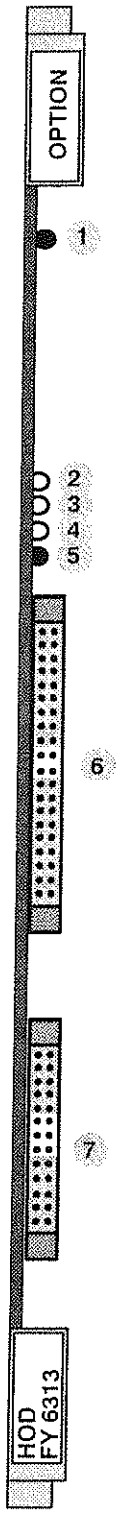
5 - 7 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

8 LED (red) temperature warning (70°C) !

9 Interface (40 pin, male): testpoint signals out

10 Programmer Interface (26 pin, male)

6.3.8 HDTV OUTPUT DIGITAL FY 6313 (OPTION)



1 LED (red): LCA configuration

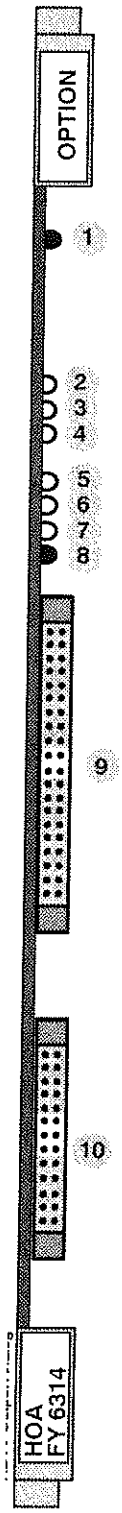
2 - 4 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

5 LED (red) temperature warning (70°C) !

6 Interface (40 pin, male): testpoint signals out

7 Programmer Interface (26 pin, male)

6.3.9 HDTV OUTPUT ANALOG FY 6314 (OPTION)



1 LED (red): LCA configuration

2 - 4 LEDs (3x green): analog+5V; -5V; -12V

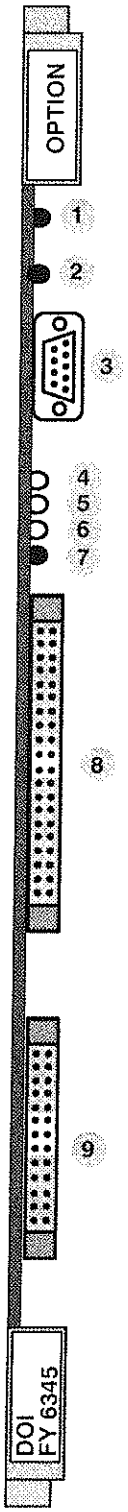
5 - 7 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

8 LED (red) temperature warning (70°C) !

9 Interface (40 pin, male): testpoint signals out

10 Programmer Interface (26 pin, male)

6.3.10 DATA OUTPUT INTERFACE FY 6345 HIPPI I.F. (OPTION)



1 LED (red): LCA configuration

2 LED (red): Restart

3 9 pole female: Programmer Interface RS232 for service terminal

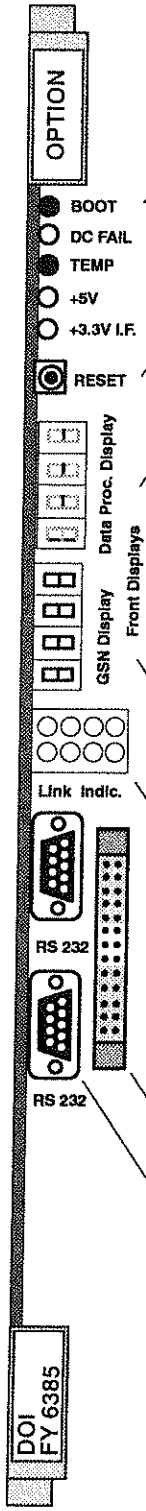
4 - 6 LEDs (3x green): VCC; M2V; VEE (+5V; -2V; -5V)

7 LED (red): temperature warning (70°C) !

8 Interface (40 pin, male): testpoint signals out

9 Programmer Interface (26 pin, male)

6.3.11 DATA OUTPUT INTERFACE FY 6385 GSN I.F. (OPTION)



LEDs

Boot	Red	Lit during firmware & software process
DC Fail	Red	At least one supply voltage generated on board is missing or out of range
TEMP	Red	At least one temperature sensor is above 75 Celsius
+5 V	Green	VCC provided by rack power supplies is available
***3.3 V**	Green	+3.3V provided by rack power supplies is available

Reset Button Pressing the RESET button resets the whole board and reloads firmware and software from flash.

Front Displays

Data Processing Display

(Propeller 4) GSN transfer finished (or aborted)

(Propeller 3) Image ready for transformation

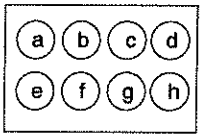
(Propeller 2) transfer start

(Propeller 1) idle loop indicator

GSN Display

Undefined	During boot process
PST1 to PSTB	Power up Test running
ERR1 to ERRB	Only in case of power up test failure
CHK	Checking the GSN link
DOWN	No optical link to adjacent GSN device detected
UP	Optical link to adjacent GSN device running

Link Indicator

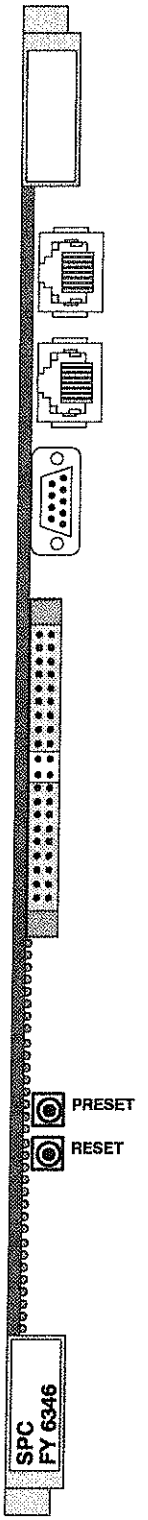


a - b - c - d	flashing every 2s flashing frequency	no transfer - board in ping mode transfer - indicates data rate
e - g - h **- g -**	on green flashing	optical link is valid no optical input

Programmer Interface

RS 232 Interfaces

6.3.12 SPATIAL PROCESSOR CONTROL FY 6346



1 RJ45 iMCS bus

2 RJ45 iMCS bus

3 Interface (9 pin, female): RS232 interface for service terminal

4 Interface (40 pin, male): testpoint signals out

5 Button 2: test for MCK (micro computer kernel)

6 Button 1: reset for MCK

hold **button 1** and press **button 2**: starts MCK mon. progr. (service)

* **Note:**
Further LEDs on the p.c. boards, see service manual.

7. FIRST STEPS

This chapter describes startup of the Spirit DataCine film scanner, including the following sections:

- Installation check
- Power on
- Basic check of the DataCine film scanner
- Control of the reference signal

ATTENTION! **For initial installation of the film scanner SDC 2002, observe the order of following sections.**

7.1 INSTALLATION CHECK

1. **Ventilation**
   Take care that the incoming air can circulate freely.
   Details see chapter 4.2 "Space requirements and environmental conditions".

2. **Check internal p.c. board positions**
   Visual check only!

   Check, that all boards from Rack 1 to Rack 3 are tightly fitted in their respective sockets.

3. **Check internal connections of the SDC 2002 cabinet**
   Visual check only!

   Check, that all plugs are fitted to the correct sockets.
   If necessary, plug loose cables into the sockets according to their label.

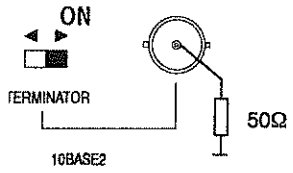
4. **Check external connections of the SDC 2002**
   Check the outputs for video and audio (option), reference signals and IMCS connections as described in chapter 5 "Connections" and chapter 3 "System Applications".

5. **Check installation of the Local Control Panel**
   Details, see chapter 4.3 "Installing Local Control Panel".

6. **Check installation of the front door handles**
   Details, see chapter 4.4

7. **Check installation of the Graphical Control Panel**
   Details, see chapter 4.5 "Installation GCP" and the separate GCP1 manual..

ATTENTION!



10Base2 port unconnected

The internal machine communication system iMCS is based on the RJ45 interface.

The TERMINATOR of the 10Base2 port of the Micro Hub must be set to "ON" - and an 50Ω terminator added - if no external device is connected!

Set TERMINATOR to "ON" -without additional 50Ω - if the port is one end of a control bus.

Set TERMINATOR to "OFF" if the control bus is connected via BNC T-connector. Details, see chapter 5.6

8. **Check the removal of locking devices (Filmdeck) and styrofoam elements (Filmdeck &AIH)**
   Details, see chapters 4.6 and 4.7.

9. **Check if lenses, filters and Xenon lamp (illumination path) are inserted**
   Details, see chapter 4.8 "Installation Lenses, filters and Xenon lamp"

10. **Check installing of Lens Gate Assembly LGA**
    Check if the appropriate Lens Gate Assembly (16 mm / 35 mm) matches the DataCine to the respective film format.

11. **Remove possible "Effect Filter" from the LGA**
    Take care that **no** "Optical Effect Filter" is installed within the Lens Gate Assembly. Use the filter first if FPN is performed. For the usage of these filters, see chapter 3 in the "Operating Instructions"

12. **Connect a Gateblast Air Compressor**
    See chapter 4.10 in this manual

13. **Check mains voltage**
    The voltage for operation is marked on the type label at the rear of the DataCine cabinet and should be checked against the actual mains voltage before switching on. Details see chapters 4.12 to "Mains Voltage Connection" in this manual.

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS Made in Germany

TYPE	SDC 2001
PART/SER.NO	0 128 530 000 / 2101
STANDARD	1125 / 1250 / 525 / 625
POWER AC	3W +N+ PE / 120/208 V / 19A, 17A, 12A
	2W + PE / - /208 V / 25A
FREQUENCY	47 - 63 Hz

Listed
Professional Video Equipment
3 S 13

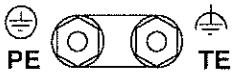
Fig. 700: **Type label SDC 2002** for 120/208 Mains Voltage - UL version - at the rear side of the DataCine cabinet

THOMSON MULTIMEDIA
BROADCAST SOLUTIONS Made in Germany

TYPE	SDC 2001		
PART/SER.NO	0 128 530 000 / 2101		
STANDARD	1125 / 1250 / 525 / 625		
POWER AC	3W+N+PE	230/400 V: 10A, 9A, 6A	X
		120/208 V:19A, 17, 12A	
	2W + PE	- /208 V: 25A	
	1W+N+PE	- /200 V: 26A	
		- /230 V: 23A	
		- /240 V: 22A	
FREQUENCY	47 - 63 Hz		

Fig. 700: **Type label SDC 2002** for 230V Mains Voltage at the rear side of the film scanner cabinet (not UL approved)

14. Earthing requirements



1. Earthing with the protective earth has to be executed with the power cord which contains the earthed protective conductor **PE** (normally).
   The earth conductor has to be connected to the **PE** screw terminal within the line filter!
2. The additional protective earth has to be connected to the central **PE** screw at the power terminal unit as earth conductor with large cross section!
3. The jumper **TE -- PE** must not be broken!
4. The earth connection has to be made **before** connecting the power cord!

Additional earth conductor

Due to its high leakage current (>3.5mA), the DataCine **must** be connected with an additional earth conductor of 6mm^2. (For more details see chapter 4.16 "Required cross sections for the mains / earth cables").
Make the earth connection with the additional earth conductor to the central **PE** screw at the power terminal unit always **before** applying mains power!
For this purpose, the line filter also carries the following warning note:

Caution !
HIGH LEAKAGE CURRENT
Earth connection mandatory
before connecting mains supply

15. **Check the installation of the power cord**

3-phase power terminal unit FH 6030

Three-phase voltage has to be connected via a power cord to the line filter in the power terminal unit (FH 6030) from the rear of the DataCine cabinet as follows:

Protective earth **PE** (**PE** has to be terminated first!)		to	⏚
Neutral	**N**	to	**N**
Phase	**U**	to	**L1**
Phase	**V**	to	**L2**)
Phase	**W**	to	**L3**

(The arrangement of the phases is optional)

Three phase mains connection

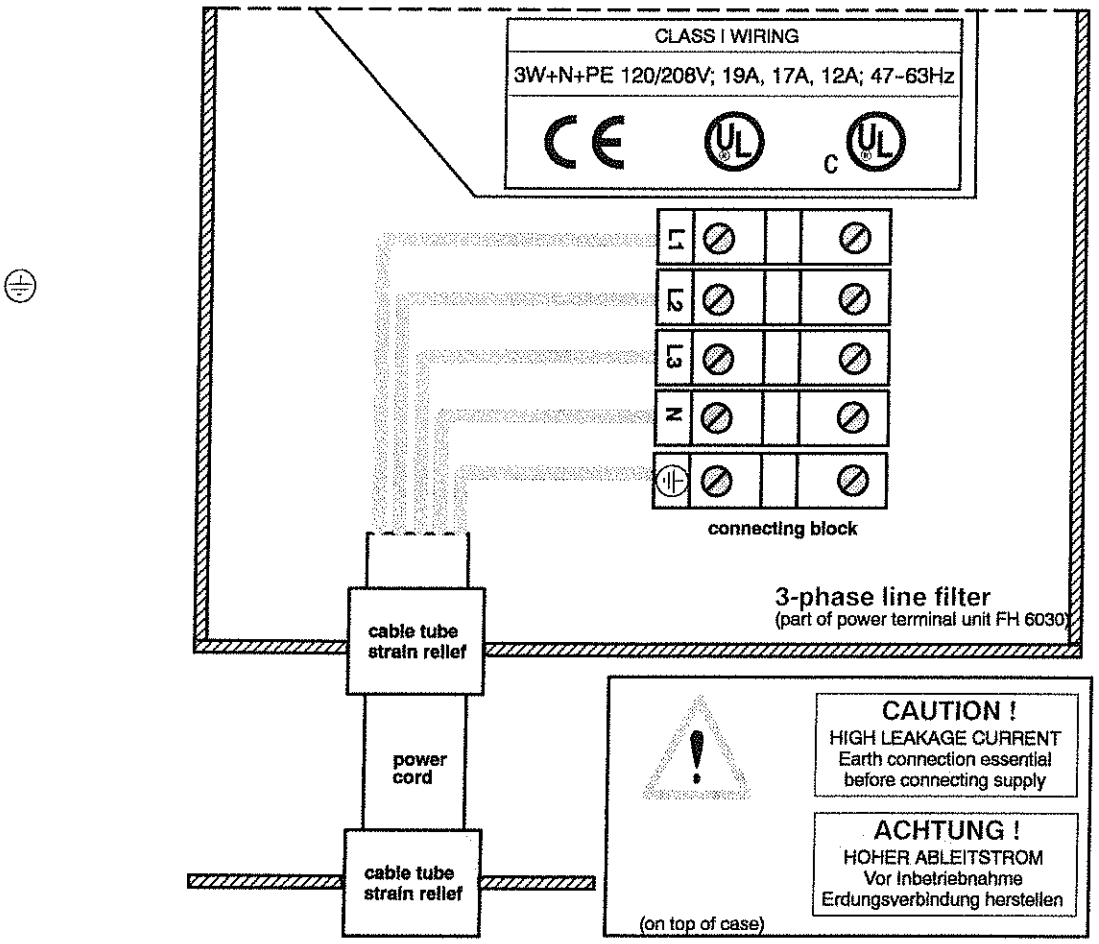


Fig. 701: **3-phase line filter**, with removed FH 6030 cover plate, top view

or

2-phase power terminal unit FH 1033 / 208V

Two-phase voltage has to be connected via a power cord to the line filter in the power terminal unit (FH 1033) from the rear of the DataCine cabinet as follows:

Protective earth **PE** (**PE** has to be terminated first!)		to	**PE** (IN)
Phase	(**L1**)	to	**L1** (IN)
Phase	(**L2**)	to	**L2** (IN)

(The arrangement of the phases is optional)

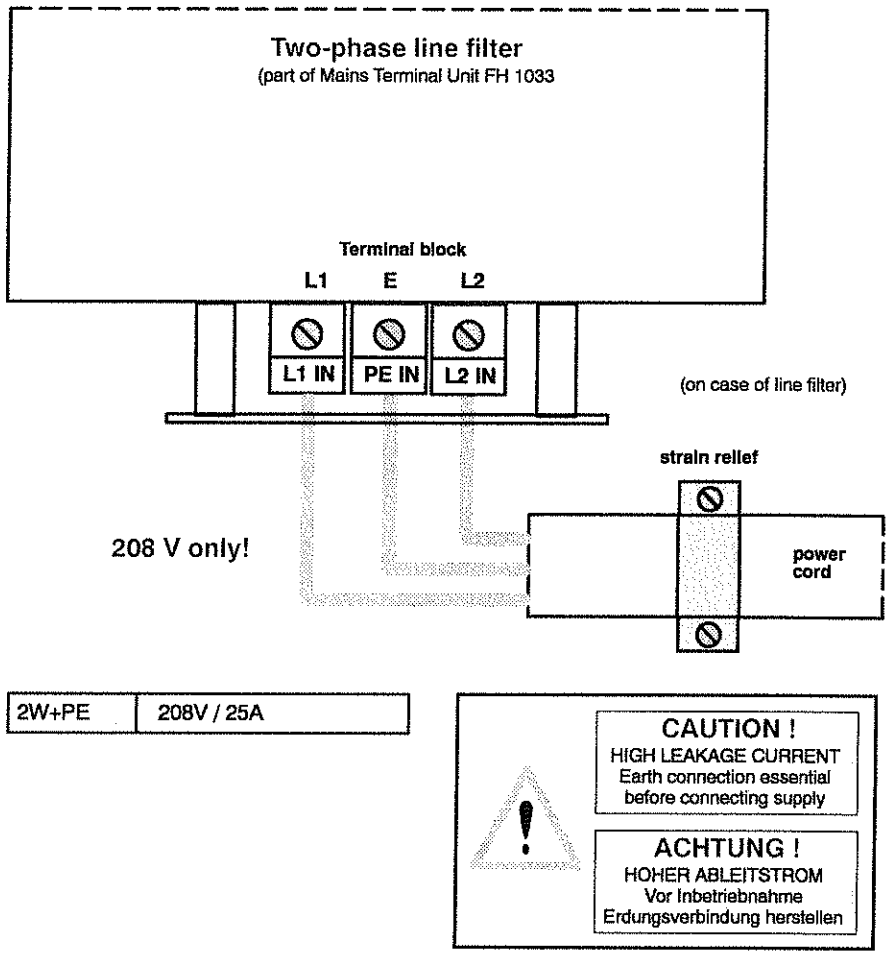


Fig. 702: **Two-phase line filter** (FH 1033), top view

or

1-phase power terminal unit (not UL approved)

The **phase-to-neutral voltage must have** a value of about **230V.**

120V-Mains operation is not possible!

Single-phase voltage has to be connected via a power cord to the line filter within the power terminal unit (FH 1032) as follows:

Protective earth (**PE** has to be terminated at first!	**PE**	to	**PE IN**
)**Phase**	**L1**	to	**L1 IN**
Neutral	**N**	to	**L2 IN**

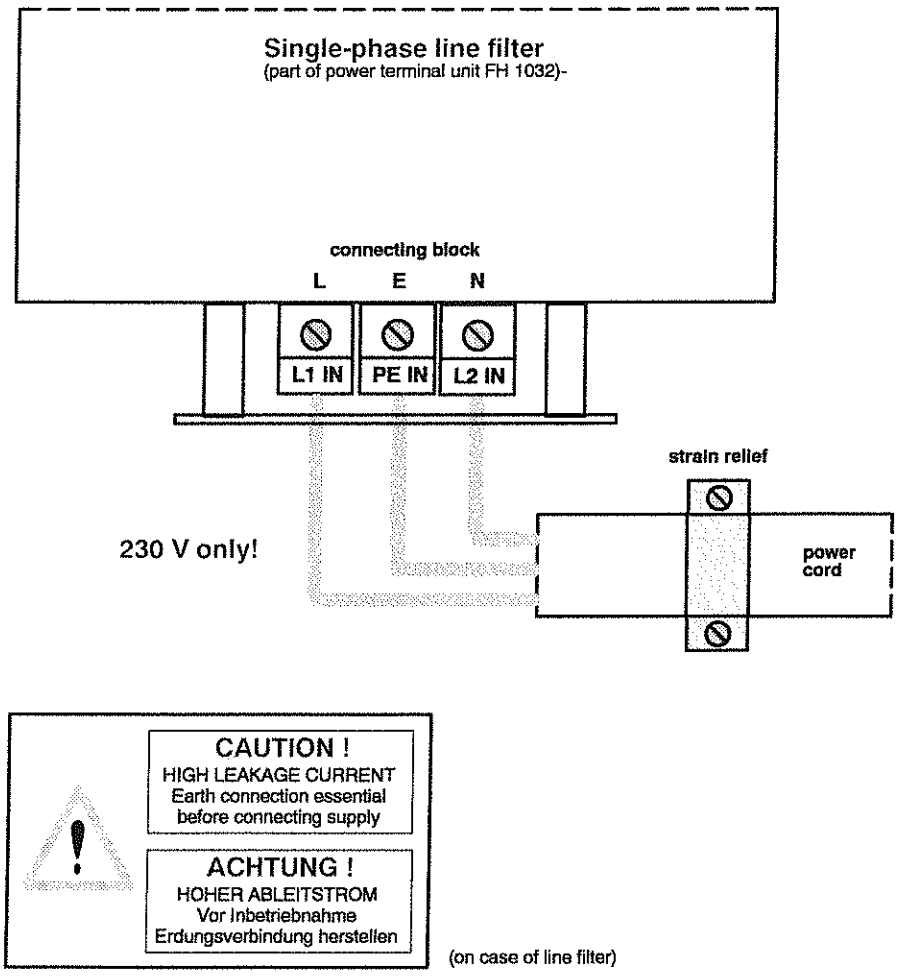


Fig. 703: **Single-phase line filter** (FH 1032), top view

7.2 POWER-ON

The film scanner is powered up with the mains switch "Power" at the front of the film scanner (Fig.704 -**1**).

To switch on the Graphical Control Panel GCP1 (Fig.704 **2**), press the power button **3**.
Note! The boot up sequence takes about 2 minutes! Details, see the separat GCP Customer's Manual.

Warm-up

After 15 minutes operating time, all characteristics are stabilized.

To avoid EMC (electromagnetic compatibility) problems keep the rear doors always closed during operation!

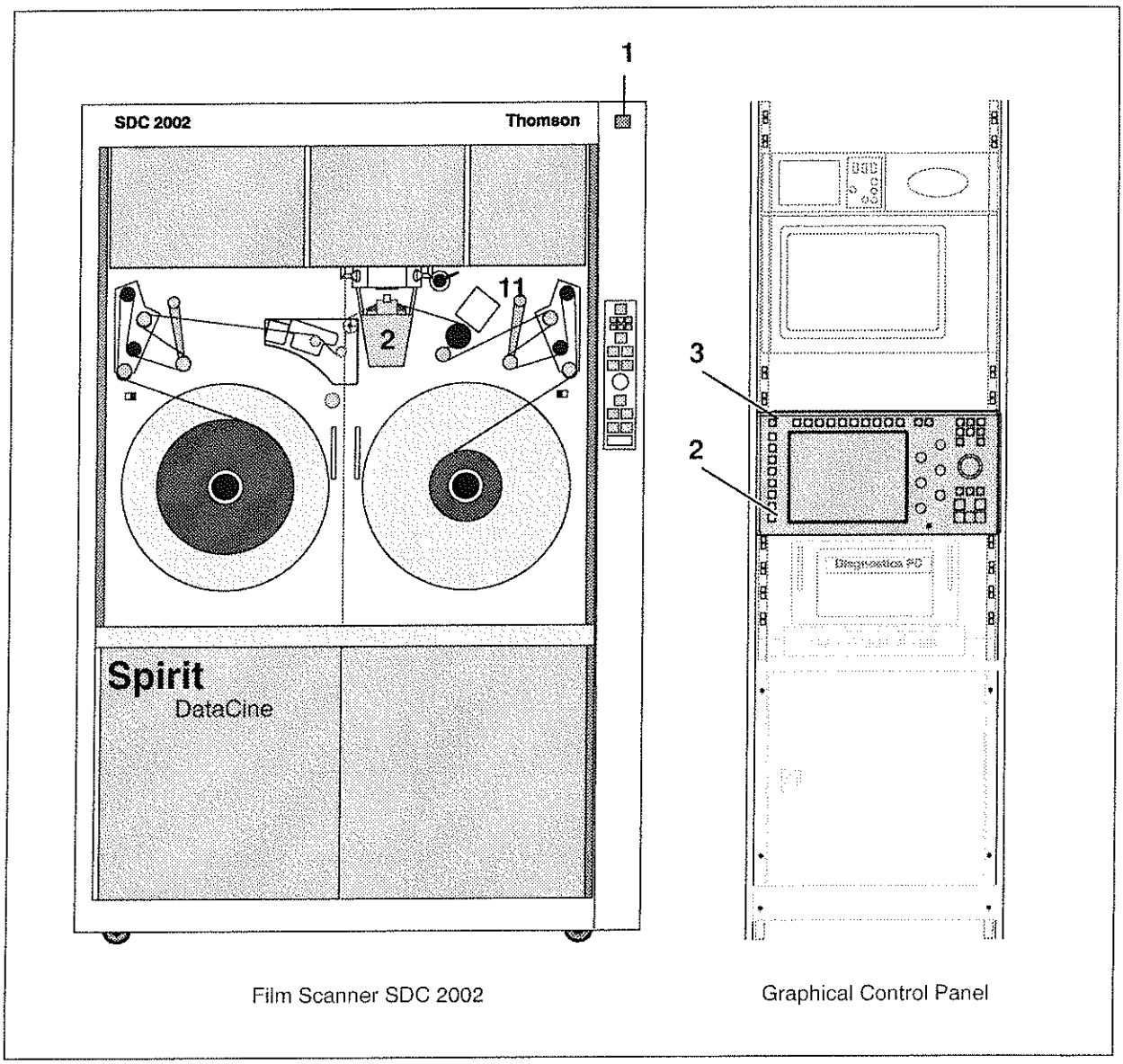


Fig. 704:

After switching on, the powerup test appears in the display of the Graphical Control Panel.

Press once the CONTROL BUTTON
to get control over the Spirit DataCine.

Next, the Home menu appears on the display. It permits the user to handle the most important machine settings and operation modes.

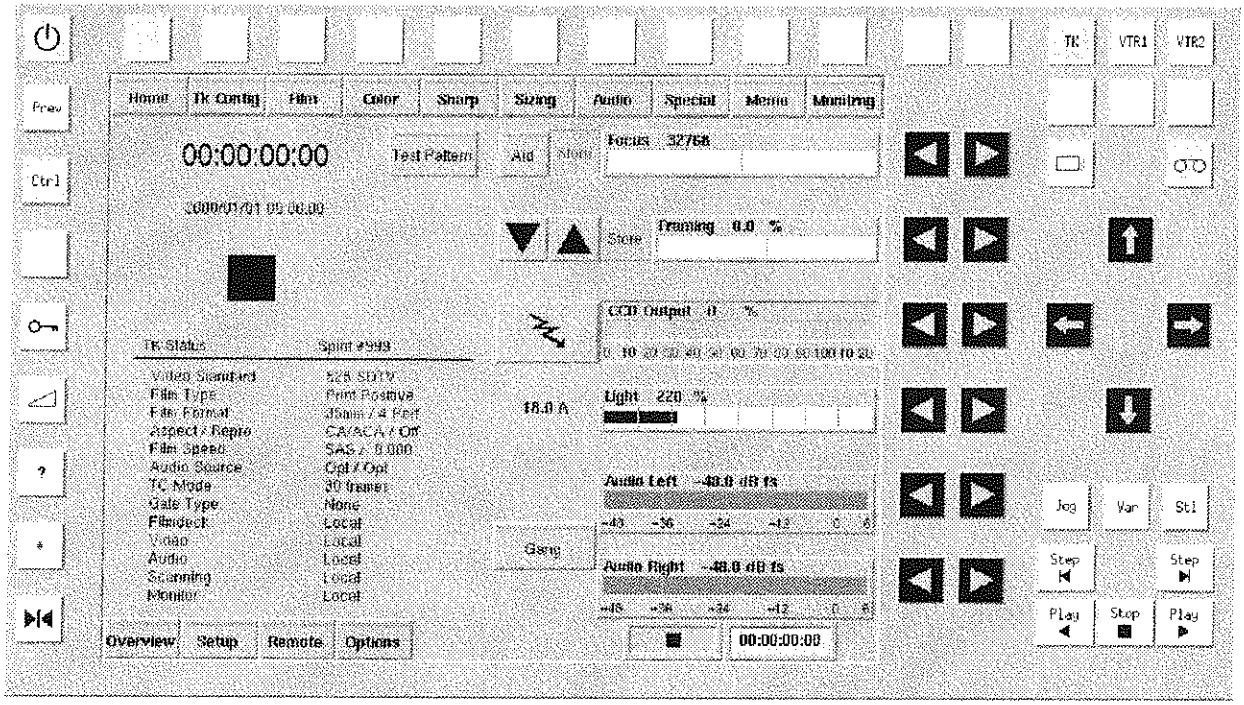


Fig. 705: Home Menu

7.3 BASIC CHECK OF THE FILM SCANNER

Graphical Control Panel is required!

For details see chapter 3.3 of the "Operation Instructions"

1. **Select TV standard**
   Menu TK Config, SDTV or HDTV submenu

2. **Check Lens Gate Assembly and Film Gate Block**
   Check wether the appropriate Lens Gate Assembly (16 mm / 35 mm) and Film Gate Block match the film scanner to the respective film format.

3. **Preparation filmdeck**
   Configuration possibilities concerning filmdeck are to be found in the menu TK Config.
   Set core diameter, Auto stop, max shuttle speed

4. **Setup film**
   Menu Film, set film type
   adapt the film scanner to the film to be played.

   - **Define film type**

PRINT POS	for color or B/W positive film
PRINT NEG	for color or B/W positive film, inverted scanning
INTERM POS	for intermediate film positive
INTERM NEG	for intermediate film negative
PRIMETIME POS	for primetime neg film, non-inverted scanning
PRIMETIME NEG	for primetime negative film, inverted scanning
COLOR POS	for color negative film, non-inverted scanning
COLOR NEG	for color negative film, inverted scanning

5. **Select Ratio 4:3 / 16 : 9**
   Menu TK Config, select SDTV ratio

6. **Select speed**
   Menu TK Config, select Film speed or SAS speed
   Select a fixed or a variable film speed.

7. **Perform FPN correction**
   Local Control Panel, press both keys FPN together

8. **Thread the film**

- Define winding direction
  The two switches A / B on the filmdeck are to be set in position A.
- Mount film roll
  or
  Mount film reel
- Thread the film according to the film threading path, printed on the filmdeck.
- Take care to put the frame bar on the cross line of the sprocket wheel.

9. **Adjust Frame Line**
   Menu Home, "set frame"
   or
   Press key FRAMING on the Local Control Panel. This effects a coarse correction of the frame line downwards (1 perforation hole downwards per film picture).

10. **Adjust optical focus**
    Functional Control Panel:
    Menu Home, "set focus"

11. **Select scanning format (fixed aspect)**
    Menu Sizing, submenu Repro, select a fixed scan format by pressing "Fix Aspect"

12. **Select fixed reproduction format (fixed repro)**
    Menu Sizing, submenu Repro, select fixed repro

13. **Adjust Film Masking**
    Menu Film, submenu Masking
    serves the color adaption to the actual film. Adaption is made optionally by selection of fixed (unity) or variable masking coefficients.

14. **Check intensity of film illumination**
    Menu Film, slide the control "CCD output" for 100% video level.
    The brightness of one of the RGB signals should reach a level of 100%.

15. **Check Video Basic Gain**
    Menu Film, set GAIN to 0 dB or 6 dB
    With very dense film material, use basic gain 6 dB

16. **Check white level and black level (Gain & Lift)**
    Menu Film
    Film scene white:
    Adjust Gain for the white adjustment
    Adjust picture white in the RGB channels to 100% video signal.
    Film scene black:
    Adjust "Lift" for the black adjustment.
    Adjust picture black in the RGB channels to 1% setup.

17. **Check black level (Black Master & Black RGB)**
    Note!

Adjustments of black Master and black RGB do not change the white level!
Menu Color,

Use film scene with picture black and stop

Menu Color

Black Master	RGB black level adjustment together; for adjust, slide control Black on the touch screen
Black RGB	magnitude and phase for R G B black level adjustm. slide directly on the colored hexagon of the touchscreen or use the the trackball

The adjustments are judged on the color monitor.

18. **Check white level (White Master & White RGB)**
Adjustments of White Master and White RGB do not change the black level!

Menu Color

Film scene with picture white

White Master	RGB white level adjustment together; for adjust, slide the control White on the touch screen
White RGB	magnitude and phase RGB white level adjust individually or mixed slide directly on the colored hexagon of the touchscreen or use the the trackball

The adjustments are judged on the color monitor.

19. **Check Gray level (Gamma Master & Gamma RGB)**

Menu Color

Film scene with a medium gradation

Gamma Master	RGB gray level adjustment together for adjust, slide the control Gamma on the touch screen
Gamma RGB	magnitude and phase RGB gray level adjust individually or mixed slide directly on the colored hexagon of the touchscreen or use the the trackball

20. **Check contour and coring**

Menu Sharp	
adjust contour	adjust for optimum H and V contour
adjust coring	adjust contour for optimum noise suppression
in	black

21. **Check audio channels (if audio option is available)**

Menu Audio, submenu A Config,	
Select Source	Off, Ext1&2, Opt or Mag, Test tone;
Select Pre-Adjust	Source pre-adjust not necessary
Select Dolby	Off or Dolby SR
select lowpass	None or 5Khz filter
Synchronize digital audio channels	int. Video or 48 Khz
Select pre-emphasis	On or Off
Select Channel mode	Mono / Stereo
Adjust lip synchronous film sound	channel 1 & 2 delay
Check film audio path with test tone	1 or 10 Khz

22. **Adjust audio level**

Menu Audio, submenu A level	
Adjust audio level	Studio level -3dB, 0dB; 4dB; 8dB;
Adjust headphone volume	
Adjust monitoring volume	

23. **Adjust Sepmag channels**

Menu Special

Submenu Extern D

Sepmag Coupling Source	Bi phase or Timecode
Sepmag Coupling	2 ppf or 10 ppf

24. Using of "Optical Effect Filters" , see chapter 3 "Operation Instructions"

7.4 CONTROL OF THE REFERENCE SIGNAL

External reference signal connections on Terminal Panel FM 6319 / **Rack 3**

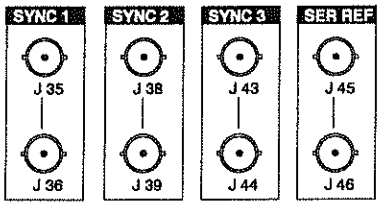


Fig. 706:

Sync 1 Loop input 1 for an analog studio reference,

SDTV: bilevel / HDTV: trilevel.

Sync 2 Loop input 2 for an analog studio reference.

SDTV: bilevel / HDTV: trilevel.

Sync 3 Loop input 3 for an analog studio reference.

SDTV: bilevel / HDTV: trilevel.

Ser Ref Loop input 3 for an analog studio reference.

Select the connected reference signal in the "Home menu, submenu Setup" , button Genlock "Ref Sync" as a reference source.

Fig. 707: Menu Setup, window Genlock Settings

The following signals can be selected from the menu:

Internal	film scanner is synchronized internally (runs free)
"EXT1"	film scanner is synchronized by genlock signal EXT1 (EXT 1: Input EXT REF SYNC 1 on terminal Rack 3)
"EXT 2" f	film scanner is synchronized by genlock signal EXT 2 (EXT 2: Input EXT REF SYNC 2 on terminal Rack 3)
"EXT 3"	film scanner is synchronized by genlock signal EXT 3 (EXT3: Input EXT REF SYNC 3 on terminal Rack 3)
"SER"	film scanner is synchronized by serial signal "SER REF"

8. BASIC OPERATION

8.1 CONDITIONS FOR BASIC OPERATION

Front doors open	**Film operation up to a fixed speed of maximally 50 frames per second is possible**
Front doors closed	**All operation modes are possible**
Front doors locked	**With a certain shuttle speed (>2 times play) closed front doors are locked additionally. The front doors are unlocked as soon as the shuttle speed (<2 times play) is reached again.**

ATTENTION! **Opening the front doors effects that a high shuttle speed is reduced to 2 times the play speed!**

To avoid EMC (electromagnetic compatibility) problems keep the SDC 2001 rear doors always closed during operation!

8.2 REPRODUCTION (LOCAL CONTROL PANEL)

8.2.1 PLAY

Play mode for playback at normal speed.

Playback in this mode is started by pressing key "Play ▶" on the control panel.

8.2.2 SHUTTLE

Select Shuttle playback if you want to reach a distant film position fast (also rewind).

The film speed is set with the multifunction dial in the range of maximally +/-10 times the normal speed (with 35mm). The dial latches in the central position (zero film speed) and in the final positions.

Shuttle playback is started by pressing key "Shtl".

Note!
The maximum film speed is reduced near the end of the film.

In high-speed shuttle playback, the video picture can serve for orientation purposes.

9. TROUBLE SHOOTING - During Commissioning -

Attention!	**Never pull or insert plug-in boards when the SDC 2002 unit is switched on!**

What to do, when **.... the key STOP on the Control Panel is blinking and the film scanner is not ready for operation.**

Local Control Panel

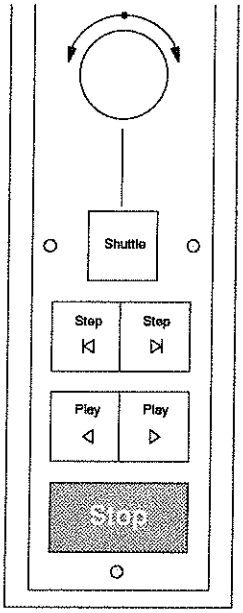


Fig. 900:

Graphical Control Panel

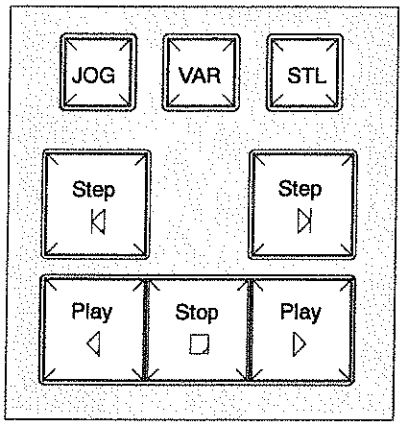


Fig. 901:

- Check if the selected reference is available:
  Menu Setup, F7 "Setup genlock"

F1	INT	Film scanner is synchronized internally
F2	"EXT 1"	Input EXT REF SYNC1 (terminal Rack 3)
F3	"EXT 2"	Input EXT REF SYNC 2
F4	"EXT 3"	Input EXT REF SYNC 3
F5	"SERREF"	Input Ser Ref

- Check if overtemperature causes problems.
  Check ventilation and all fans.

What to do, when **..... the SDC2001 cannot be repowered**

- Set the power switch in position "**off**"
- Open the rear doors
- Check the power connection to the SDC 2002:
  - Mains voltages at the Mains Terminal Board FH 1031 (FH 1033)
  - 3 (2) phase circuit breaker
- Push the reset button of the internal SDC 2002 thermal switch (figure 902).
- Close the rear doors
- Switch on the film scanner

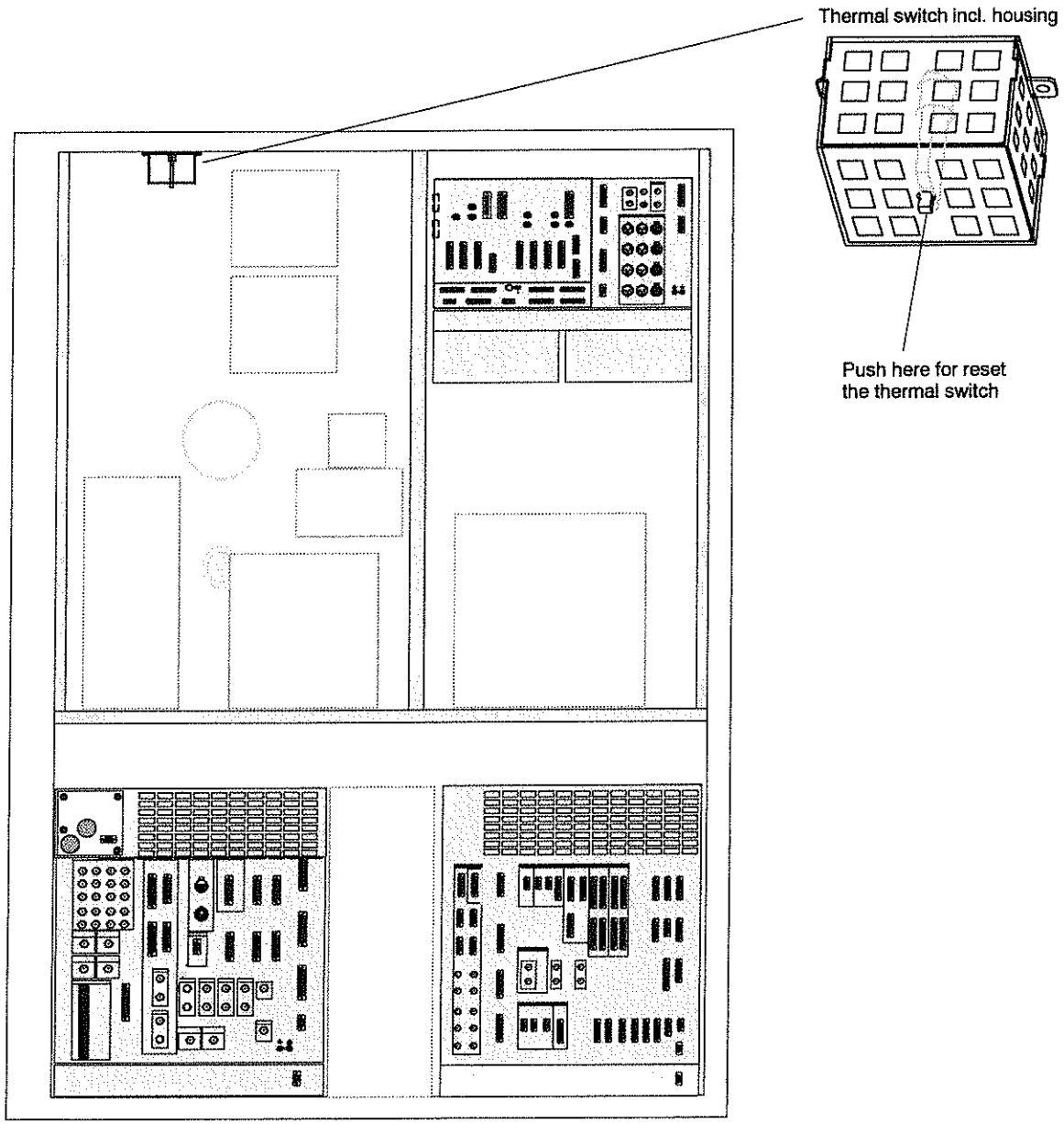


Fig. 902: SDC 2002 with thermal switch

10. INTERFACES

Overview

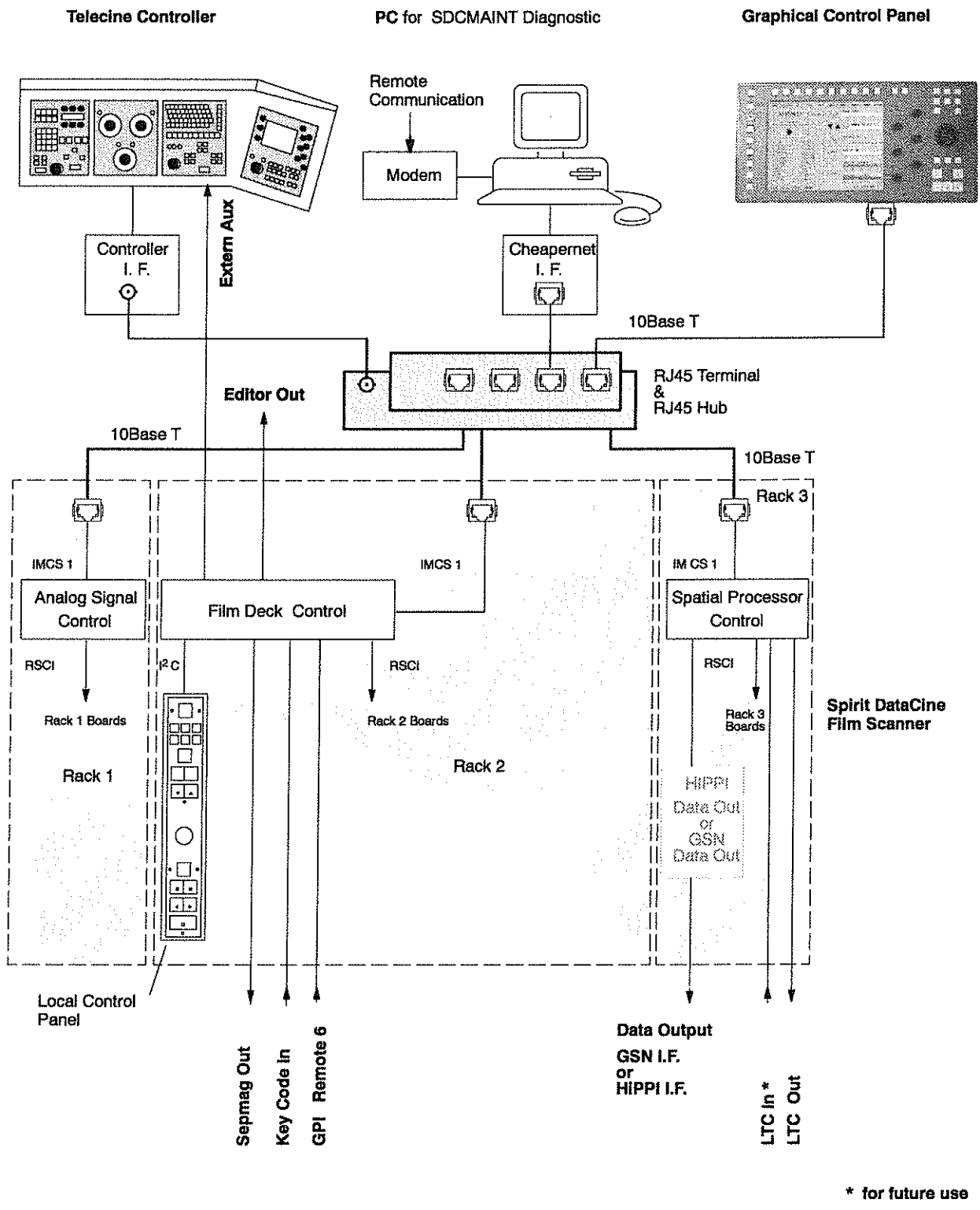


Fig. 1000:

10.1 RJ45 / IMCS (INTERNAL MACHINE COMMUNICATION SYSTEM)

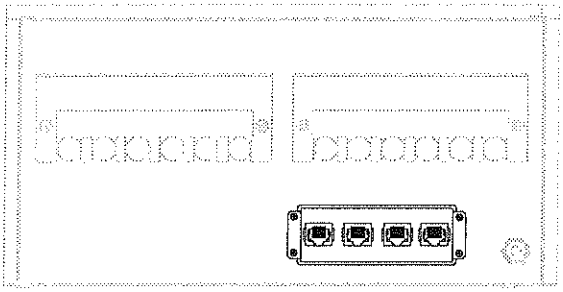


Fig. 1001: RJ45/iMCS on Terminal Panel

Cheapernet system

The main components of the control system are connected via the serial IMCS bus system with each other (IMCS = internal machine communication system).

This bus is based on Ethernet standard IEEE 802.3.

The participants in the IMCS 1 system are:

Rack 1	Analog Signal Control
Rack 2	Film Deck Control Gateway Control (optional)
Rack 3	Spatial Processor Control

The Graphical Control Panel, various telecine controllers and a diagnostics PC can be accommodated within the IMCS net via RJ45 connectors on Terminal Panel.

ANSI standard

Standard	IEEE 802.3
Data rate	10 Mbit/sec
Max. cable length	max. 100 m
Cable type	STP/UTP Category 3 or better
Connector	RJ45

10.2 HIPPI DATA OUTPUT I. F. FY 6345
GSN DATA OUTPUT I. F. FY 6385

Overview

This chapter outlines the basic approach for data transfer between the Spirit Datacine Film Scanner and a computer system.

Data Conversion modes

The following data conversion modes are supported:

1. **"TVLEV"** Image data maintains the TV video levels:
   black level $64_{d\ (10\ bit)}$
   white level $940_{d\ (10\ bit)}$
   within a total range of $0 - 1023_{d\ (10\ bit)}$

2. **"GRLEV"** Image data is mapped to graphic video levels
   black level 0_{d}
   white level $1023_{d\ (10\ bit)}$
   within a total range of $0 - 1023_{d\ (10\ bit)}$

3. **"DXR"** Printing density characteristic for
   CINEON DXR (Digital Extended Range) files
   - e. g. used for post-production systems like Inferno / Fire (Discreet Logic) or Domino (Quantel) -
   which captures the dynamic range of NEG films.

4. **"TV_PD"** Images, color graded on a TV monitor, are mapped to Printing Density characteristic for CINEON DXR files
   - e. g. used for post-production systems like Inferno / Fire (Discreet Logic) or Domino (Quantel).

5. **"DXR-G"** Printing density characteristic for CINEON DXR files, which captures the dynamic range of NEG films.
   In addition to the DXR mode, the DXR-G mode provides a closer color matching to the Kodak **Genesis** scanner.

6. **"TV-G"** Images, color graded on a TV monitor, are mapped to Printing Density characteristic for CINEON DXR files.
   In addition to the TV_PD mode, the TV-G mode provides a closer color matching to the Kodak **Genesis** scanner.

7. **C-PD** Cineon Print Density
   This logarithmic characteristic is close to the ideal Cineon print density characteristic. The density range is from 0 to 2.0.
   In addition to the TV_PD mode, the TV-G mode provides a closer color matching to the Kodak **Genesis** scanner.

Data Transfer via Film Scanner HIPPI Channel

In general the HIPPI channel will be treated like a video channel. It is assumed that the receiving device is able to cope with the amount of data. Therefore the operator has to select the film speed which is appropriate for the application.

The maximum data rate via the HIPPI channel will be 100 MB/s.

The lowest film speed for continuous film transport will be: 3 filmframes / s

The resolution can be selected.

Horizontal = 256 ... 2048 pixel,

Vertical = 256 ... 1832 lines

The amount of data depends on film format.

- Data is only RGB or Y selectable
- Color sequence is R G B or B G R selectable.
- Special mode for key channel transfer.

Maximum pixel resolution is 10 bits. The scale can be logarithmic or linear (selectable).

General handling of data

- For every film frame a HIPPI-FP packet is generated.
- HIPPI-FP packets consist of Header-Area and D2-Area. There is no D1-Area.
- The first 8K block within the D2-Area is reserved for file or image information.
- Image information always begins at the first 8K boundary of the D2 area (= DPX recommendation).

HIPPI I_Field 1 x 32 bit	HIPPI Header_Area = 2 x 32 bit	File header (DPX or TIFF) = 8192 Byte 0x0000....0x1FFF	Image-Data ..... 0x2000.....

- File information will correspond to SMPTE 268M DPX file format, see also notes on page 10-9. All core information will be provided.

Film Scanner Data Output

Parallel I.F. Standard

The physical interface follows the HIPPI-PH standard (High-performance parallel interface, mechanical, electrical and signalling protocol specification *ANSI X3.183 - 1991, New York*).

Serial I.F. Standard

The serial interface operates according to the HIPPI Serial Specifications *ANSI X3.300-1997*, using HIPPI-PH compatible signalling sequence and protocol (*ANSI X3.183-1991*).

The protocol of data transfer follows the HIPPI-FP standard (high-performance parallel interface, framing protocol *ANSI X3.210-1992*).

Data Format

The interface is 32 bits wide. Organization is shown in figure 1002. Normally a HIPPI-FP packet consists of three areas: header_, D1_ and D2_Area. In general the D1_Area is needed to exchange control information via the HIPPI channel. In the film scanner, the data output is controlled over a separate interface according to the Ethernet standard with an IP/UDP protocol so that the D1_Area is dropped.

In the HIPPI-FP packet, the byte order is opposite to the bit-significance of the 32bit-word, i.e. byte 0 is located in the bits 24...31 and byte 3 in the bits 0...7. Independent from this order the byte order of the image data in the D2_Area is determined by a switch in the header area of the image data (magic number in DPX files).

The following explanations refer to the items in the packet format (figure 1002).

- **ULP-id:** bit 24...31, id for Upper Layer Protocol, this information can be configured via the control system: default = 10000000; (1xxxxxxx = locally assigned)
- **P:** bit 23, D1_Data_Set_Present, set to 0.
- **B:** bit 22, Start_D2_on_Burst_Boundary, set to 0 (D2_Area may start at or before beginning of second burst of the packet, burst = 256 words = 1kbyte).
- **D1_Area_Size:** bit 3...10, no D1_Area present, set to 0.
- **D2_Offset:** bit 0...2, no offset, data-set begins at start of D2_Area, set to 0.
- **D2_Size:** 32 bits, length in bytes of the data in D2_Area except of fill-bytes at the end (0 D2_Size 4Gbytes-2).
- **D2_Area:** starts and ends on a 64-bit boundary, filled at the end in case of need.

Contents of I-field

- **For Data Output FY 6315.11 - 13**

BYTE 0	BYTE 1	BYTE 2	BYTE 3
0x87	0x65	0x43	0x21

Note:

Bit 31 is set to 1; therefore bits 30 - 0 are implemented in conformance to a private (locally defined) protocol.

- **For Data Output FY 6315.14 and higher**

BYTE 0	BYTE 1	BYTE 2	BYTE 3
0x03	0x00	0x00	0x01

- **For Data Output FY 6345.11 and higher**

BYTE 0	BYTE 1	BYTE 2	BYTE 3
0x03	0x00	0x00	variable*

* = set via Graphical Control Panel; menu TK Config - submenu Data Destination

Note:

1. destination routing
2. camp on
3. dest = 1
4. src = 0

	BYTE 0			BYTE 1				BYTE 2				BYTE 3			
bit	31							23				15			7
Header_	**ULP-id**				P	B	**Reserved**					**D1_Area_Size**			D2_ Offset
Area	**D2_Size**														
Area D2_Area	**D2_Data_Set**														

Fig. 1002: **HIPPI-FP packet format**

HIPPI Connection Model

Datagram Mode and Stream Mode are supported. This mode can be selected via the control system (GCP - TK Config menu - submenu Data - connection mode).

Details of Stream Mode:

Single connection, multiple packets.
The film scanner sets up a single connection and sends multiple PACKETS on that connection (REQUEST/CONNECT)

Details of the Datagram Mode:

Single connection, single packet.

Film scanner sets up a single connection (REQUEST/CONNECT) and sends one PACKET on that connection.

After the transmission of the packet the connection is released. (REQUEST/CONNECT/DISCONNECT)

One PACKET is always one film frame.
One standard burst consists of 256 * 32 bit data. The single allowed *"Shortburst"* will always be the last burst of a packet.

Image data format

The image data is always placed in the D2_ Data_ Set.

Address 0 - 1FFFH reserved for DPX or TIFF header.
Address 2000H ... : start of image data.

For the transfer of digital component data into the 32-bit HIPPI channel six selectable modes are provided, illustrated in chapter 10.2.1.

Selectable Modes 1 - 6

1. 3*8 bit + key - channel
2. 3*10 bit
3. 3*10 bit + key-channel expanded to 4*16 bit (1pixel in 2 HIPPI-Words)
4. 3*10 bit Y - only (3 pixel per HIPPI-Word)
5. 2 *10 bit expanded to 2 * 16 bit (Lum only) (2 pixel in 1 HIPPI-Word)
6. 3 * 10 bit key-channel (3 pixel per HIPPI-Word)

Image Data Format

The standardized format is shown in the following tables.

DPX - SMPTE 268M header information					
field	**offset**	**length**	**type**	**name**	**content**
1	0	4	U32	magic number	0x53445058 (ASCII-code of "SDPX")
2	4	4	U32	offset to image data	0x00002000 (8k) bytes
3	8	8	ASCII	version number of header format	V1.0
4	16	4	U32	total image file size in bytes	size of(element_1) + 0x2000 /*header*/
6	24	4	U32	generic sect. length	1664 as default
7	28	4	U32	industry sect. length	384 as default
8	32	4	U32	user-def. sect. length	6144 as default
15	660	4	U32	Encryption key	0xFFFFFFFF
17	768	2	U16	image orientation	0 as default
18	770	2	U16	no. of image elements	always 1
19	772	4	U32	pixels per line	x-value of reproduction format
20	776	4	U32	lines per image	y-value of reproduction format
21	780	image element 1			
21.1	780	4	U32	data sign	0 (unsigned)
21.2	784	4	U32	reference low	8bit = 0 10bit = 0 16bit = 0 as default
21.3	788	4	R32	reference low quantity	0 as default (float)
21.4	792	4	U32	reference high	8bit = 255 10bit = 1023 16bit = 65535
21.5	796	4	R32	reference high quantity	2.047 as default (float)
21.6	800	1	U8	descriptor	4 = (Key-only) 6 = (Y-Only) 50 = (R,G,B) 51 = (R,G,B,key) 151 = (B,G,R) 152 = (B,G,R,key)
21.7	801	1	U8	transfer characteristic	0 = user defined 1 = printing dens or 2 = linear 3 log
21.8	802	1	U8	colorimetric spec.	0 = user defined or 1 = printing dens or 2 = not applicable
21.9	803	1	U8	bit size	mode 1: 8 mode 2, 4, 6: 10 mode 3, 5: 16

DPX User defined data					
field	**offset**	**length**	**type**	**name**	**content**
21.10	804	2	U16	packing	mode 1, 3, 5: 0 (packed into 32bit words) mode 2, 4, 6: 1 (filled into 32bit words) ***— notes —*** *1-HIPPI-Word sequence in 8 bit mode* *31...24: R* *23...16: G* *15...08: B* *07...00: key* *2-HIPPI-Word sequence in 16 bit mode* *word n:* *31...16: R* *15...00: G* *word n+1* *31...16: B* *15...00: key* *the SMPTE DPX header uses for the 3*10bit mode a "right justified" notation of the 30 bits. In order to be compatible with Kodak CINEON images, the notation "left justified" is used for RGB images instead* *bits:* *31..22 : R* *21..12 : G* *11..02 : B* *01..00 : spare* *Y-only images are according to DPX !!!* 31...30 : spare 29...20 : Yn+3 19...10 : Yn+2 09...00 : Yn+1
21.11	806	2	U16	encoding	0
21.12	808	4	U32	offset to data	0x00002000
21.15	812	4	U32	end of line padding	0 by default
21.15	816	4	U32	end of image padding	0 by default
21.15	820	32	ASCII	description	
gap					
41	1628	8	2*U32	pixel aspect	Horizontal: vertical
gap					
43	1664	2	ASCII	Film manufacturer ID	2 digits of film edge code
44	1666	2	ASCII	Film type ID	2 digits of film edge code
45	1668	2	ASCII	Frame offset	2 digits of film edge code
47	1670	6	ASCII	Prefix (film reel ID)	2 digits of film edge code
48	1676	4	ASCII	Count (film length i. feet)	2 digits of film edge code
gap					
50	1712	4	U32	position in sequence	actual filmtimer value
gap					
58	1920	4	U32	SMPTE timecode	film keycode in case
59	1924	4	U32	SMPTE user bits	film keycode in case
61	1929	1	U8	field number	

DPX User defined data					
Field	**Offset**	**Length**	**type**	**Name**	**Content**
gap					
75	2048	32	ASCII	User identification	"Thomson – SPIRIT DATACINE "
76.1	2080	4	ASCII	User Magic Number	"PDPX" identifies that this is a valid UD-header
76.2	2084	1	U8	Board Type	Thomson internal Data 00 = FY6315 01 = FY6345
76.3	2085	1	U8	FirmwareVersion ID	Thomson internal Data Same Number as on control panel
76.4	2086	1	U8	Protocol Version ID for user defined header area	Thomson internal Data
76.5	2087	1	U8	Future Use Tbd	Thomson internal Data
76.6	2084	4	U32	Spirit Status	Bit 0..1 00 = don't care 01 = output mode transfer 02 = output mode display 03 = output mode continous Bit 15...2 undocumented
76.7	2088	1	U8	Data-Board Transfer Function	Thomson internal Data 00h = standard log 01h = linear 02h = TV-Log 03h = DXR-Log 04h = future use 05h = future use 06h = future use 07h = future use
76.8	2093	1	U8	Spirit Transfer Function	Thomson internal Data Bit 0: CRT-GAMMA 0 = OFF 1 = ON
76.9	2090	1	U8	Primary Modes (Color Correction)	Thomson internal Data Bit 2..0: primary mode 00: print positive 01: intermediate positive 02: print negative 03: color negative 04: primetime negative 05: primetime positive 06: intermediate negative 07: color positive
76.10	2095	1	U8	Tbd	Tbd
76.11	2096	2	U16	Linear low reference value	Thomson internal Data 0: for Video Levels 64: for Graphic Levels
76.12	2098	2	U16	Linear high reference value	Thomson internal Data 940: for Video Levels 1023: for Graphic Levels
76.13	2100	2	U16	Steadyness X-Vector	Thomson internal Data Default = 0x8000 (1 unit = 1/100µm)
76.14	2102	2	U16	Steadyness Y-Vector	Thomson internal Data Default = 0x8000 (1 unit = 1/100µm)
76.15	2104	1	U8	Optic Type	Thomson internal Data 00: 01: 02: 03:

DPX User defined data					
Field	**Offset**	**Length**	**type**	**Name**	**Content**
76.16	2105	1	U8	Future Use Tbd	Thomson internal Data
76.17	2106	2	U16	Future Use Steadyness Rotation Angle	Thomson internal Data Rotation angle (0x8000 = 0°) 0..360° = 0x0000...0xffff
76.18	2108	2	U16	H-Scanning area	Thomson internal Data 1 unit = 1µm
76.19	2110	2	U16	V-Scanning area	Thomson internal Data 1unit = 1µm
76.20	2112	2	U16	Center Position X	Thomson internal Data 1unit = 1µm
76.21	2114	2	U16	Center Position Y	Thomson internal Data 1unit = 1µm
76.22	..	..	..	Future Use TBD	
76.xx	2559	1	U8	Future Use TBD	Last element of SPIRIT DataCine generated User Data

TIFF (Tag Image File Format)[1]

The second image file header format provided by Spirit DataCine Film Scanner is TIFF, mostly used in consumer applications. The maximal length is 4 GBytes. A TIFF file begins with an 8-byte image file header that points to an image file directory (IFD) containing information about the image and pointers to the image data.

This TIFF header implementation is based on :

TIFF Revision 6.0

Final - June 3,1992

The TIFF header can only be used together with the

- 4 * 8 bit RGB+key mode
- 4 * 16 bit RGB+key mode

All other modes are not supported by the current implementation of most readers and not noted in any standard release.

The following drawing shows the TIFF structure.

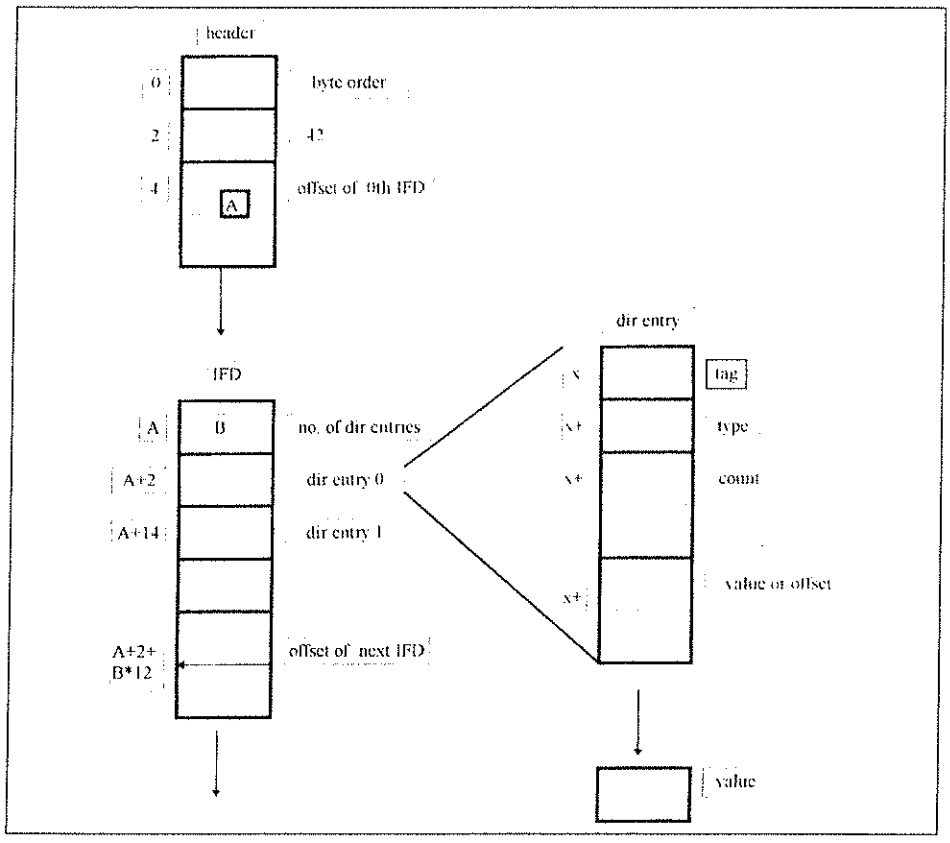


Fig. 1003:

1. *TIFF Revision 6.0, June 3, 1992, Aldus co., Seattle*

TIFF image file header		
bytes	name	content
0,1	byte order	"MM" (0x4d4d), big-endian
2,3	TIFF ID	42
4...7	offset in bytes of first IFD	= 10
8...9	gap	random number
10...11	number of tags	= 15
12.....	start of IFDs	see IFDs

TIFF image file directory (IFD)		
bytes	name	content
0,1	Tag (field id)	16-bit number
2,3	field type	1 = BYTE 2 = ASCII 3 = SHORT 4 = LONG 5 = RATIONAL
4...7	Count	no. of values of indicated type
8...11	Value/Offset	value if <= 4bytes otherwise file offset (in bytes) to value

The following table shows the required fields for R,G,B,Alpha full color images. SPIRIT does not provide breaking an image into several strips, so the number of StripOffsets (tags 273) and StripByteCounts (tag 279) is one and RowsPerStrip (tag 278) corresponds to ImageLength.

IFD of RGB full color image				
Tag	Name	Type	count	value(s)
255	New SubfileType	LONG	1	1
256	ImageWidth	SHORT/LONG	1	no. of pixels per scanline
257	ImageLength	SHORT/LONG	1	no. of scanlines
258	BitsPerSample	SHORT	SamplesPerPixel	8/16
259	Compression	SHORT	1	1 (no)
262	Photometric Interpretation	SHORT	1	2 (=RGB)
256	Fill Order	SHORT/LONG	1	no. of pixels per scanline
273	StripOffsets	SHORT/LONG	1	byte offset of image data from beginning of file
277	SamplesPerPixel	SHORT	1	4 (R,G,B,key)
278	RowsPerStrip	SHORT/LONG	1	ImageLength
279	StripByteCounts	SHORT/LONG	1	ImageWidth*ImageLength* SamplesPerPixel*(BitsPerSample/2)
282	XResolution	RATIONAL	1	235,176 = random no. of pixels per resolution unit horizontal
283	YResolution	RATIONAL	1	235,176 = random no. of pixels per resolution unit vertical
296	ResolutionUnit	SHORT	1	2 (= no absolute measurement)
296	Extra Samples	SHORT	1	2 (= Unassociated ALPHA Data)

Note! Not all TIFF readers can read R, G, B, Alpha images.

The following software packages can read SPIRIT TIFF files:

- **imgview** of SGI - IRIX 6.2 can read 4*8 bit R, G ,B, Alpha and 4*16 bit R, G, B, Alpha but not 16-bit greyscale images.
- **polyview** for Windows 95 can read 16- bit greyscale images but no R G B images with 4 components.

10.2.1 PIXEL ASSIGNMENT TO THE 32 BIT HIPPI DATA BUS

Mode 0		Mode 1		Mode 2			
4x8bit RGBK		3x10bit RGB		4x16bit RGBK			
	HIPPI-WORD, BIT#		HIPPI-WORD, BIT#	PIXEL M	HIPPI-WORD N	PIXEL M	HIPPI-WORD N+1
RED 9	31	RED 9	31	RED 15	31	BLUE 15	31
RED 8	30	RED 8	30	RED 14	30	BLUE 14	30
RED 7	29	RED 7	29	RED 13	29	BLUE 13	29
RED 6	28	RED 6	28	RED 12	28	BLUE 12	28
RED 5	27	RED 5	27	RED 11	27	BLUE 11	27
RED 4	26	RED 4	26	RED 10	26	BLUE 10	26
RED 3	25	RED 3	25	RED 9	25	BLUE 9	25
RED 2	24	RED 2	24	RED 8	24	BLUE 8	24
GREEN 9	23	RED 1	23	RED 7	23	BLUE 7	23
GREEN 8	22	RED 0	22	RED 6	22	BLUE 6	22
GREEN 7	21	GREEN 9	21	RED 5	21	BLUE 5	21
GREEN 6	20	GREEN 8	20	RED 4	20	BLUE 4	20
GREEN 5	19	GREEN 7	19	RED 3	19	BLUE 3	19
GREEN 4	18	GREEN 6	18	RED 2	18	BLUE 2	18
GREEN 3	17	GREEN 5	17	RED 1	17	BLUE 1	17
GREEN 2	16	GREEN 4	16	RED 0	16	BLUE 0	16
BLUE 9	15	GREEN 3	15	GREEN 15	15	KEY 15	15
BLUE 8	14	GREEN 2	14	GREEN 14	14	KEY 14	14
BLUE 7	13	GREEN 1	13	GREEN 13	13	KEY 13	13
BLUE 6	12	GREEN 0	12	GREEN 12	12	KEY 12	12
BLUE 5	11	BLUE 9	11	GREEN 11	11	KEY 11	11
BLUE 4	10	BLUE 8	10	GREEN 10	10	KEY 10	10
BLUE 3	9	BLUE 7	9	GREEN 9	9	KEY 9	9
BLUE 2	8	BLUE 6	8	GREEN 8	8	KEY 8	8
KEY 9	7	BLUE 5	7	GREEN 7	7	KEY 7	7
KEY 8	6	BLUE 4	6	GREEN 6	6	KEY 6	6
KEY 7	5	BLUE 3	5	GREEN 5	5	KEY 5	5
KEY 6	4	BLUE 2	4	GREEN 4	4	KEY 4	4
KEY 5	3	BLUE 1	3	GREEN 3	3	KEY 3	3
KEY 4	2	BLUE 0	2	GREEN 2	2	KEY 2	2
KEY 3	1	0	1	GREEN 1	1	KEY 1	1
KEY 2	0	0	0	GREEN 0	0	KEY 0	0

Mode 3		Mode 4		Mode 5	
3x10bit Y-Only		2x16bit Y-Only		3x10bit K-Only	
3 PIXELS	HIPPI-WORD, BIT#	2 PIXELS	HIPPI-WORD, BIT#	3 PIXELS	HIPPI-WORD, BIT#
0	31	Y 15 [N+1]	31	0	31
0	30	Y 14 [N+1]	30	0	30
Y 9 [N+2]	29	Y 13 [N+1]	29	KEY 9 [N+2]	29
Y 8 [N+2]	28	Y 12 [N+1]	28	KEY 8 [N+2]	28
Y 7 [N+2]	27	Y 11 [N+1]	27	KEY 7 [N+2]	27
Y 6 [N+2]	26	Y 10 [N+1]	26	KEY 6 [N+2]	26
Y 5 [N+2]	25	Y 9 [N+1]	25	KEY 5 [N+2]	25
Y 4 [N+2]	24	Y 8 [N+1]	24	KEY 4 [N+2]	24
Y 3 [N+2]	23	Y 7 [N+1]	23	KEY 3 [N+2]	23
Y 2 [N+2]	22	Y 6 [N+1]	22	KEY 2 [N+2]	22
Y 1 [N+2]	21	Y 5 [N+1]	21	KEY 1 [N+2]	21
Y 0 [N+2]	20	Y 4 [N+1]	20	KEY 0 [N+2]	20
Y 9 [N+1]	19	Y 3 [N+1]	19	KEY 9 [N+1]	19
Y 8 [N+1]	18	Y 2 [N+1]	18	KEY 8 [N+1]	18
Y 7 [N+1]	17	Y 1 [N+1]	17	KEY 7 [N+1]	17
Y 6 [N+1]	16	Y 0 [N+1]	16	KEY 6 [N+1]	16
Y 5 [N+1]	15	Y 15 [N]	15	KEY 5 [N+1]	15
Y 4 [N+1]	14	Y 14 [N]	14	KEY 4 [N+1]	14
Y 3 [N+1]	13	Y 13 [N]	13	KEY 3 [N+1]	13
Y 2 [N+1]	12	Y 12 [N]	12	KEY 2 [N+1]	12
Y 1 [N+1]	11	Y 11 [N]	11	KEY 1 [N+1]	11
Y 0 [N+1]	10	Y 10 [N]	10	KEY 0 [N+1]	10
Y 9 [N]	9	Y 9 [N]	9	KEY 9 [N]	9
Y 8 [N]	8	Y 8 [N]	8	KEY 8 [N]	8
Y 7 [N]	7	Y 7 [N]	7	KEY 7 [N]	7
Y 6 [N]	6	Y 6 [N]	6	KEY 6 [N]	6
Y 5 [N]	5	Y 5 [N]	5	KEY 5 [N]	5
Y 4 [N]	4	Y 4 [N]	4	KEY 4 [N]	4
Y 3 [N]	3	Y 3 [N]	3	KEY 3 [N]	3
Y 2 [N]	2	Y 2 [N]	2	KEY 2 [N]	2
Y 1 [N]	1	Y 1 [N]	1	KEY 1 [N]	1
Y 0 [N]	0	Y 0 [N]	0	KEY 0 [N]	0

11. INDEX

Numbers

6 SCC, - 6 Sector Color Correction, 1-4, 1-32

A

AC power
- check, 4-44, 7-2
- cord, 4-54, 7-4
- supply, 4-44
- terminal, 4-46

Accessories, 1-9, 4-4

AIH, 1-2, 1-13, 1-21

Air Exhaust Hood, 1-15

Air quantity, 2-1

Analog
- imaging head, 1-2
- video, 1-5
- audio, 1-7

Aperture, 2-7

ASC, 1-25

Audio
- analog, 1-7
- delay, 2-14
- digital, 1-7
- formats, 1-7, 2-13
- inputs, 2-12, 2-13, 5-6
- monitoring, 2-13
- option, 1-7, 1-14, 2-12
- outputs, 2-12, 2-14, 5-6
- path, 1-27
- processing, 1-7, 1-21, 1-26
- reference, 2-13, 5-7
- scanner, 1-14, 1-26
- specifications, 2-13

B

Basic accessories, 1-9, 4-4

Beam splitter, 1-24

Bi phase signal, 5-15

Blanking, 2-8

C

Cable feed-through, 5-1

Cabling
- mains, 4-43
- keycode reader , 3-15
- control panel, 4-9
- external devices, 3-1

Capstan servo, 1-46, 1-47

CCD
- scanner, 2-6
- sensor, 1-3, 1-24

CCIR, 2-14, 5-33, 5-36

CFR, - signal, 5-16

Check
- AC power, 4-44
- film scanner, 7-9
- installation, 7-1
- reference, 9-2

Clock distribution, 1-33

Color correction, 1-4, 1-29, 1-31, 2-8
- 6 SCC, 1-32

Color framing, 2-11, 5-10, 5-16

COMMAG, 1-26, 2-14

Commissioning, 4-44, 7-1

COMOPT, 1-26, 2-14

Condenser lenses, 4-4, 4-16

Connection
- external, 5-1
- rack 1, 5-4
- rack 2, 5-8
- rack 3, 5-27
- units, 5-3

Connections
iMCS, 5-44
RJ45, 5-44

Contour Correction, 1-4, 2-7

Control, - system, 1-6, 1-20, 1-52, 2-9

Coring, 1-37

Creativity, 1-2
- Package, 1-6

D

Data format, 2-15

Data Interface, 5-42

Data Mode, 1-20

Data Output, 1-2, 1-45, 2-15, 10-3

Detail extract, 1-32
Diagnostics, 1-10
Dichroic filter, 1-25
Digipot, 1-51
Digital
- video, 1-5
- audio, 1-7
Dolby SR/SRD, 2-12
DTV
- 1280x720 / 1920x1080, 1-8
- Output Signals, 1-38, 1-42

E

Editor, - interface, 5-12
Effect filter, 1-3, 4-21, 7-12
Environmental conditions, 2-1, 4-5
Extern
- aux, 2-11, 5-13
- keycode, 5-9
- reference, 2-12

F

Fast aperture, 1-23, 2-5
FDC, 1-29, 1-32, 1-48
Features, 1-3
Film
- capacity, 2-5
- clock, 1-33
- formats, 1-3, 2-4
- gate, 2-6
- post processing, 1-34
- pre processing, 1-29
- reels, 1-4
- scanning, 2-5
- scanning unit, 1-21
- speed Data Out, 2-15
- speeds, 2-4, 2-19
- spooling servo, 1-46
- store, 1-29
- transport, 1-4, 2-4
- types, 1-3, 2-4
Filmdeck, 1-13
Filter wheel, 1-23
First steps, 7-1
Focus Control, 2-6
FPN, 1-29, 1-30, 1-48
Framing, 1-48, 2-5
Functional control panel, 1-6, 1-49
Fuses, 4-45, 4-54, 4-58, 4-61

G

Gamma correction, 2-8
Gate Block, 1-24
Gateblast Unit, 1-4, 2-6, 4-41
Genlock generator, 1-34, 1-38
GPI I.F., 1-53, 5-21
Graphical Control Panel, 1-49, 7-7
Ground load, 4-3
Grounding, 4-47
GSN Data Interface, 5-43
GSN Transferengine, 1-8, 1-14

H

HDTV, 2-19
- processing, 1-8, 1-14
- mode, 1-20
HIPPI, 2-15, 10-3, 10-4
Home menu, 7-8
Hub, 5-44

I

I/O interfaces, 2-11
I2C bus, 1-53
Illumination, 2-5
Image Size, 2-15
iMCS, 1-49, 1-53, 2-11, 5-18, 10-2
Infrared filter, 1-23
Installation, 4-1
- check, 7-1
- FCP, 4-9
- gateblast compressor, 4-41
- lenses, 4-21
- power cord, 4-55, 7-4
Integration cylinder, 1-24, 2-5
Interfaces, 10-1
- Editor out, 5-12
- Extern aux, 2-11, 5-13
- FRS out, 2-11, 5-37
- HIPPI, 2-15
- iMCS, 2-11

- Keycode in, 5-9
- Remote 4/5, 5-20
- Remote 6, 5-21
- Sepmag out, 5-11
- TC gen out, 5-11
- iMCS, 10-2

Introduction, 1-2

K

Key signal, 1-37

Keycode
- Mounting Support, 1-14
- Reader Installation, 4-22
- Reader, 1-5

Keycode in, 5-9

L

Lamp Xenon, 4-16

Lens Gate Assembly, 1-6

Lenses, 1-22, 4-16

LGA, 1-13, 1-23, 2-6, 4-4

Local Control Panel, 1-13, 1-48

Locking device, 4-12

M

Main menus, 1-49

Mains
- cables, 4-54
- connection, 4-43
- systems, 4-49
- voltage, 4-44
- connection, 2-3
- supply, 2-3

Mains voltage, 7-2

Manuals, 1-9, 4-4

Masking, 2-7

Matrix, 1-34, 1-37

Mechanical dimension, 2-3, 4-5

Monitoring, 1-29, 1-33, 5-23

O

Operation, 8-1
- temperature, 2-1, 4-6

Operational controls, 6-1

Optical
- block 16 mm, 1-3
- path, 1-22

Options, 1-14, 2-13

Output, - signals, 1-20

Overview, 1-13

P

Particle transfer rollers, 1-6

Peak area load, 4-3

Picture, - stability, 2-5

Pixel reformatting, 1-32

Play mode, 1-48, 8-1

Power
- consumption, 2-3
- cord, 7-4
- terminal, 4-46

Power on, 7-7

Power up test, 7-8

Projection lens, 1-22, 1-24, 4-16

Protective earth, 4-47

PTR Rollers, 1-6, 1-11, 1-14

Pulse
- CFR, 5-15
- SOF, 5-15

R

Rack 1, 6-1

Rack 1 to 3, 1-19

Rack 2, 1-13, 6-7

Rack 3, 1-13, 5-27, 6-20

Reference, - signal, 7-13

Remote
- 4 to 6, 5-20
- LAN, 5-18
- RS 422, 5-20
- selection, 1-48
- control, 1-6
- iMCS, 1-6, 5-18, 10-2

Reproduction (play), 8-1

Resolution, 2-19

RJ45, - terminal panel, 5-1, 5-44

Rotation, 1-2, 1-8, 2-19

RS 422 I.F., 1-53

RSCI, 1-32, 1-53

Run up time, 2-4

S

Safety
- bolts, 4-12
- instructions, 4-1
- locking devices, 4-12
- regulations, 2-1
- shutter, 1-23

Scanner
- resolution, 1-24
- system, 1-24

SDCMAINT, 1-10

SDTV, - link A/B, 1-37, 5-30

SEPMAG, 2-11
- interfaces, 1-5
- output, 5-11

Serial HiPPI Interface, 5-42

Servo system, 1-46

Shuttle mode, 1-48, 8-1

Signal/noise, 2-7, 2-19

Sizing, 1-4

SMPTE, 5-31

SOF, - signal, 5-15

Spatial, - processing, 1-34, 1-36

SPC, 1-39

Special characteristics, 1-3

Specifications, 2-1

Spirit DataCine Film Scanner, 1-2

Standby mode, 1-48

Steadiscan, 1-9, 1-15, 2-21

Step mode, 1-48, 2-4

Stop mode, 1-48, 2-4

System application, 3-1

T

Terminal Panel EMC, 5-1

Terminal Panel RJ45, 5-1, 5-44

Test Films, 1-11

Theory of operation, 1-19

Thermal switch, 9-3

Time code
- output, 5-11
- system, 1-5

Transfer Engine, 1-14
- GSN, 1-8
- Package, 1-8

Tri level sync, 2-19, 5-38

Trouble shooting, 9-1

TV
- standard, 1-3, 2-7
- store, 1-34, 1-38
- standard DTV, 1-8

Type label, 4-44

U

Unpacking, 4-2

V

Ventilation, 4-7, 4-45

Video
- analog, 1-5
- digital, 1-5
- HDTV, 2-19
- out HDTV, 2-19
- outputs, 1-14, 2-12
- ref HDTV, 2-19, 5-27
- resolution, 2-7
- signal path, 1-17
- specifications, 2-7
- standard, 2-7, 2-19
- output SDTV, 1-39
- HDTV out parallel, 5-32
- HDTV out serial, 5-35
- outputs, 5-27
- SDTV, 5-30

Visible search, 2-4

Vistavision, 1-2, 1-3, 2-20

W

Waveform monitoring, 1-6, 2-13, 3-14, 5-23

Weight, 2-3, 4-1

Winding plates, 1-4

X

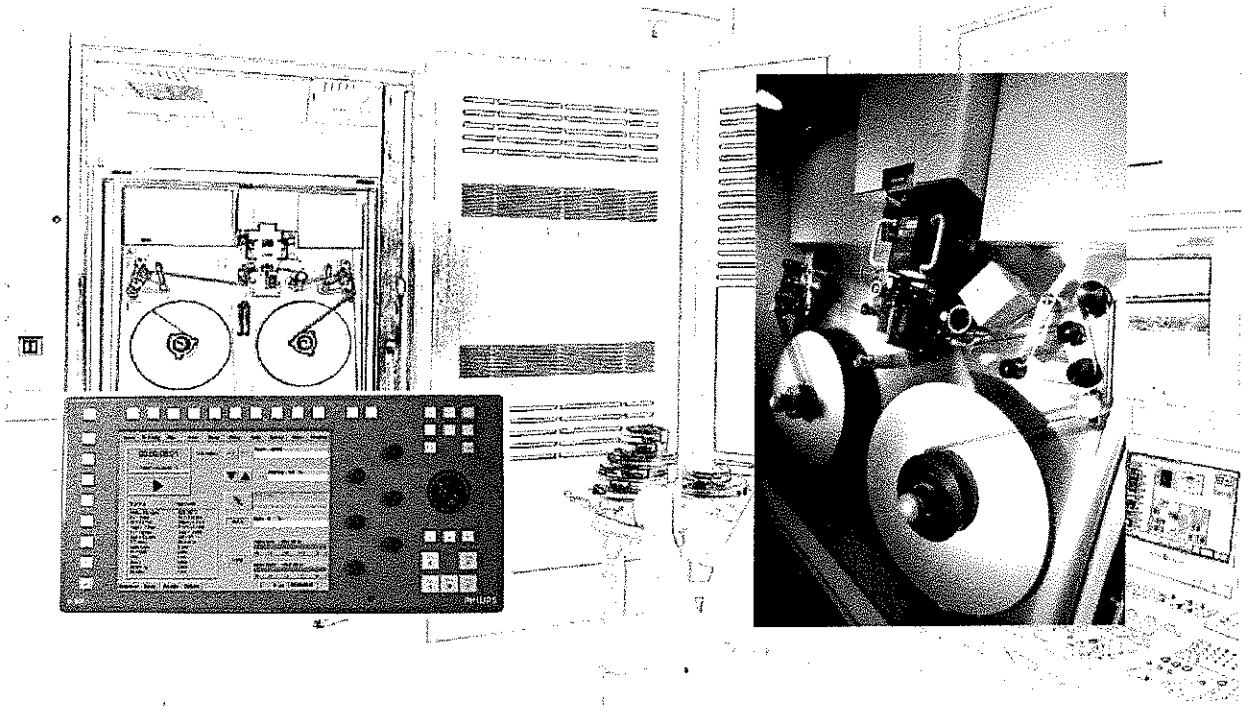
Xenon lamp, 1-9, 1-11, 1-22, 2-5, 4-16

Z

Zoom, 2-19

Spirit DataCine® Filmscanner

SDC 2002



Operating Instructions

GCP controlled
Prepared for S8 Film Scanning
Free programmable LUT for Data Output
Reference Store
Prepared for GSN Interfacing
Operating Software 4.60

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

Published by

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

BTS Media Solutions GmbH

Brunnenweg 9
D-64331 Weiterstadt, Germany
P.O. Box 1165

Tel: +49 (0) 6155-870-0
Fax: +49 (0) 6155-870-300

Web Sites
Internet: www.thomsonbroadcast.com
www.imagingsystems.de
Intranet: www.weiterstadt.thmulti.com

Trademarks

All product names mentioned in this manual are the trademarks of their respective owners.

Copyrights

Information in this document is subject to change without notice.
This document and any updates and/or supplemental information, including any copies thereof, cannot be reproduced, neither communicated to a third party, without written authorization from **THOMSON multimedia Broadcast Solutions**.

Please notify THOMSON multimedia Broadcast Solutions of any errors in this document. We also would appreciate any comments you have to improve this manual.

© BTS Media Solutions GmbH 2002. All rights reserved.

6. Maintenance

6.1. Safety instructions 6-2

6.2. Clean the film drive mechanism 6-3
6.2.1. Clean illumination slit and film guiding of the film gate 6-4
6.2.2. Clean the capstan roller 6-5
6.2.3. Clean and degauss the commag audio head 6-6

6.3. Clean the light path 6-7
6.3.1. Clean the projection lamp 6-8
6.3.2. Clean condenser lens 1 6-9
6.3.3. Clean the infrared filter 6-9
6.3.4. Clean the heat absorbing filter 6-10
6.3.5. Clean the light control (fast aperture) 6-10
6.3.6. Clean the filter of the filter wheel 6-10
6.3.7. Clean condenser lens 2 6-11
6.3.8. Clean the front area of the light splitter 6-12

6.4. Clean the optical block 6-13
6.4.1. Clean the condenser and fibre optic part 1 6-13
6.4.2. Clean the condenser and fibre optic part 2 6-14
6.4.3. Clean the integration cylinder 6-15
6.4.4. Clean the entrance and the exit lens of the sizing optics 6-16

6.5. Change the projection lamp 6-17

6.6. Clean the comopt sound optics 6-21

6.7. Change the comopt sound lamp 6-22

6.8. Clean the air filters 6-26
6.8.1. Adjust compressed air of the gateblast unit 6-32

6.9. Clean the blowers 6-33

6.10. Change the backup battery 6-35
6.10.1. Change the backup battery in the film scanner 6-35
6.10.2. Change the backup battery in the Functional Control Panel 6-36

6.11. Clean or replace PT roller 6-37

7. Trouble Shooting

8. Index 8-1

1. ABOUT THE MANUAL

This manual is part 1 of the Customer's Manual.

It informs the user about control and display elements, operational preparations, operation, maintenance and trouble shooting.

1.1. SOFTWARE STATE

1.1.1. SDC 2002 DataCine

The present manual documents the following software states:

Film scanner SDC 2002 operating software version V4.60

GCP: Graphical Control Panel Op. sw V1.8.7

1.1.2. Telecine Controllers

- Pandora Platinum
  The Spirit DataCine operating software V 4.60 was tested by Thomson with Platinum software version 4.2.8

- Da Vinci "Mainframe 2k"
  The Spirit DataCine operating software V 4.60 was tested by Thomson with Mainframe 2K software version 2.2.8

2. CONTROL AND DISPLAY ELEMENTS

2.1. SDC 2002 FILM SCANNER

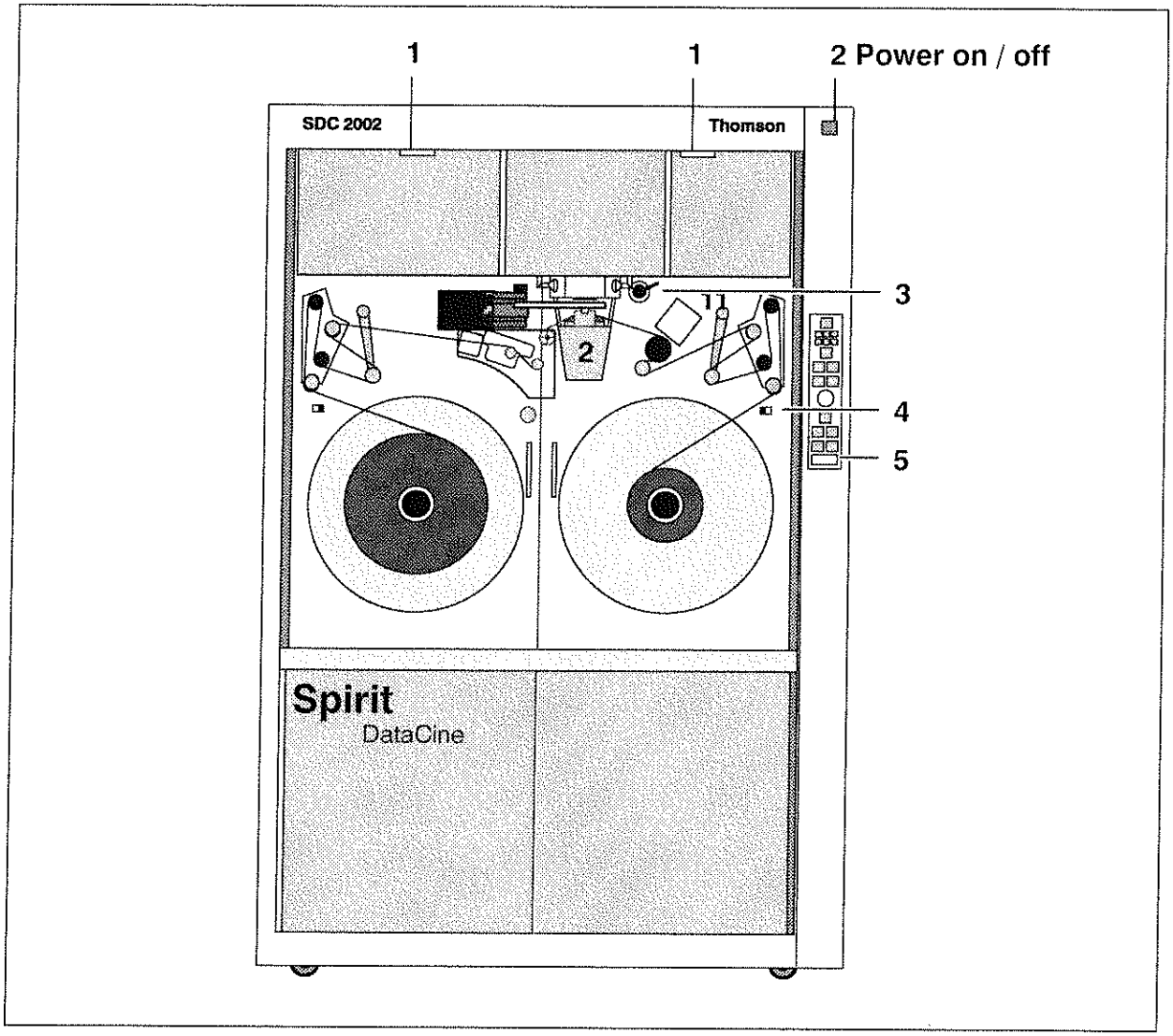


Fig. 201: SDC 2002 Spirit DataCine film scanner

Overview

1	***Lamps (2x)***	... serve the lighting of the film scanner interior. Can be switched off, if required.
2	***Power***	... mains switch for switching on/off the film scanner.
3	***Locking lever***	... locking lever for the optical block (LGA, lens gate assembly). The optical block is locked by turning the locking lever in cw direction.

4 *Wind A / B* ... switch for selecting the winding direction of the threaded film.

WIND A
Winding direction in ccw direction.

WIND B
Winding direction in cw direction.
Application: for rewinding a film threaded with inverse sides.

5 *Control Panel* ... Local Control Panel FH 6500 for Play, Stop, Step, Shuttle, FPN, Framing, Stand by, additional functions and remote delegation.
For further details see section 2.2.1.

2.2. CONTROL PANELS

2.2.1. LOCAL CONTROL PANEL FH 6500

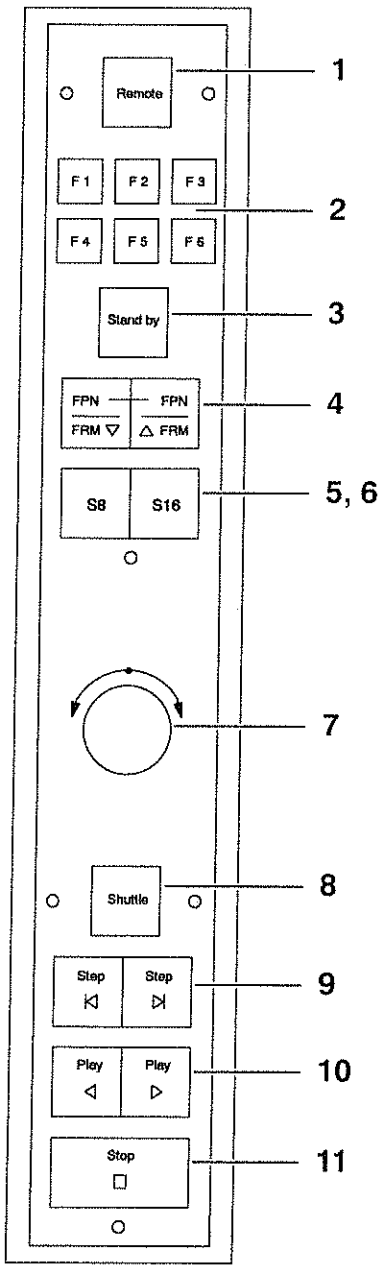


Fig. 202: Local Control Panel FH 6500

1 Key Remote ... pressing the key delegates the control functions from the Local Control Panel to an external Remote Control Panel and vice versa (toggle mode).
The key is lit when the control functions are remotable.

Automatic switchover from **Remote to Local Control Panel**:

1. with Stand by ON and pressing key Stand by (3, e.g. in an emergency)
2. pressing key Stop.

2 *Function keys (6x)* ... not assigned.
Quick selection for future functions.

3 *Key Stand by* ... Indicates that the machine is ready for operation.
Momentary-contact pushbutton switch for switching on the standby mode.
The winding motors are switched on (film is automatically tightened) and the capstan motor is released for operation.

Prior to settings, always carry out FPN correction first.

During operation, the Stand by key lamp has to be lit all the time.

4 *Keys FPN (2x)* ... switches on the automatically noise signal compensation: Fixed Pattern Noise and

shading correction (shading signal compensation and white balance).

During compensation, the picture gate has to be open (no film threaded).

In order to avoid operational errors, this key function is only enabled when pressing the two momentary-contact pushbutton switches (4) FPN/FRM at the same time.

4 *Keys FRM ▽ / △* ... momentary-contact pushbutton switch for coarse framing adjustment by means of the film frame line.

Setting range:
Each time the key is pressed, the film will be shifted in downward or upward direction by one perforation whole per picture of the picture height.

5 *Key S8* . . Pre selection of S8mm film scanning for FPN correction*1, *2

6 *Key S16* . . Pre selection of 16mm film scanning for FPN correction*1, *2

*1 Only activ in case S8mm Option is installed!
*2 S8mm and S16mm gate operate with the same gate coding.

7 *Control* **Function together with key Shuttle (8):**
for rapidly locating a scene in forward and reverse run.

Function together with key Focus adjust/assist (5/6):
for optical film focusing.

8 *Key Shuttle* ... visible search mode is switched on (selected: shuttle speed = 0 and audio channel is muted).
Shuttle mode can be entered from all operational modes.

The search speed is set with control (7) and remains constant.

rotation to the left = film motion reverse

rotation to the right = film motion forward

9 Keys Step ⏮ / ⏭ ... single-frame selection forward/reverse.
On pressing the step key, the film scanner will automatically enter the Stop mode. Still frame has broadcast quality.

After Stop the projection lamp is switched to reduced lighting power immediately (approx. 5 s after Stop the safety shutter is closed).

10 Keys Play ◀ / ▶ ... film presentation in the forward or reverse mode.
Can be entered from all operating modes.

The projection lamp is switched to full lighting power.

11 Key Stop ■ ... from the Play mode: quick stop.
From the Shuttle mode: termination of the search function.

2.2.2. GRAPHICAL CONTROL PANEL GCP 1

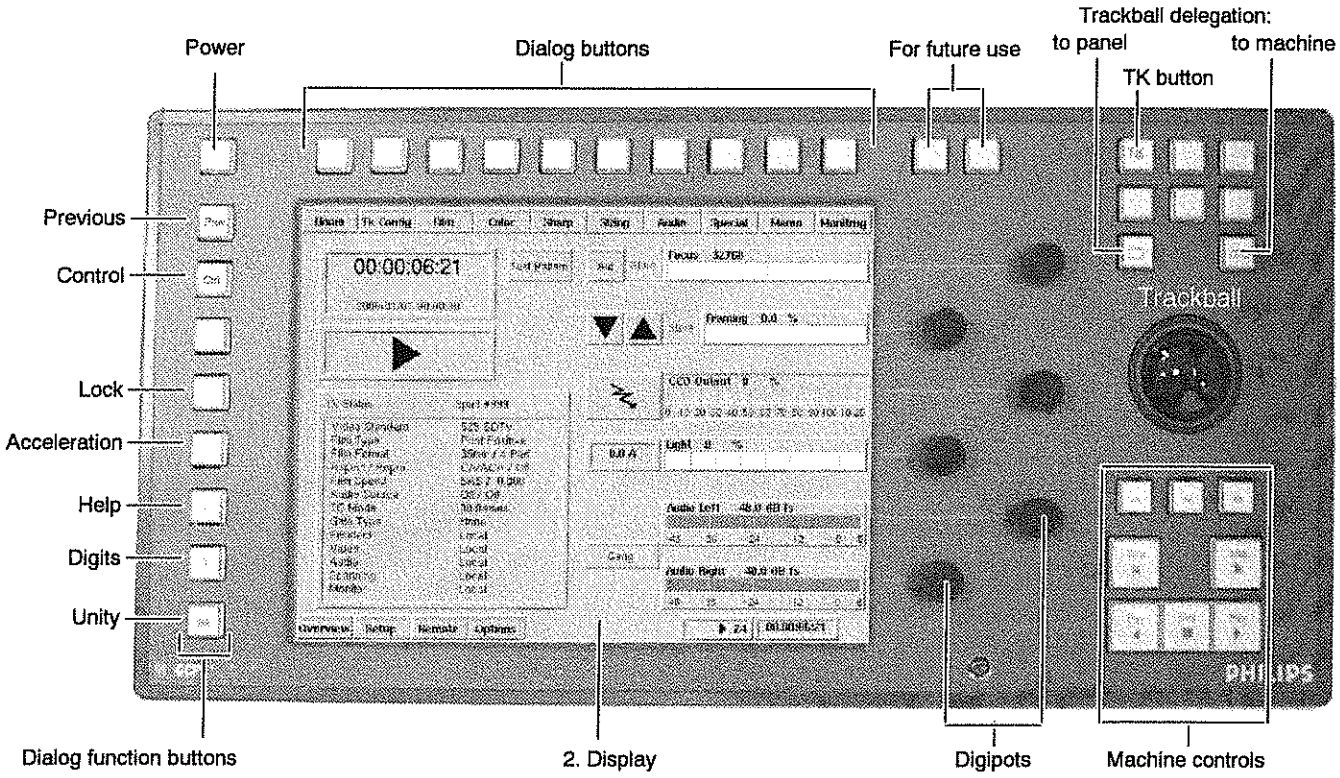


Fig. 203: Functional Control Panel CP1

Machine Control Section

The Machine Control Section is located in the lower right corner of the GCP. All buttons (including the trackball - if delegated) perform transport functions of the telecine. Undeclared buttons are currently not in use.

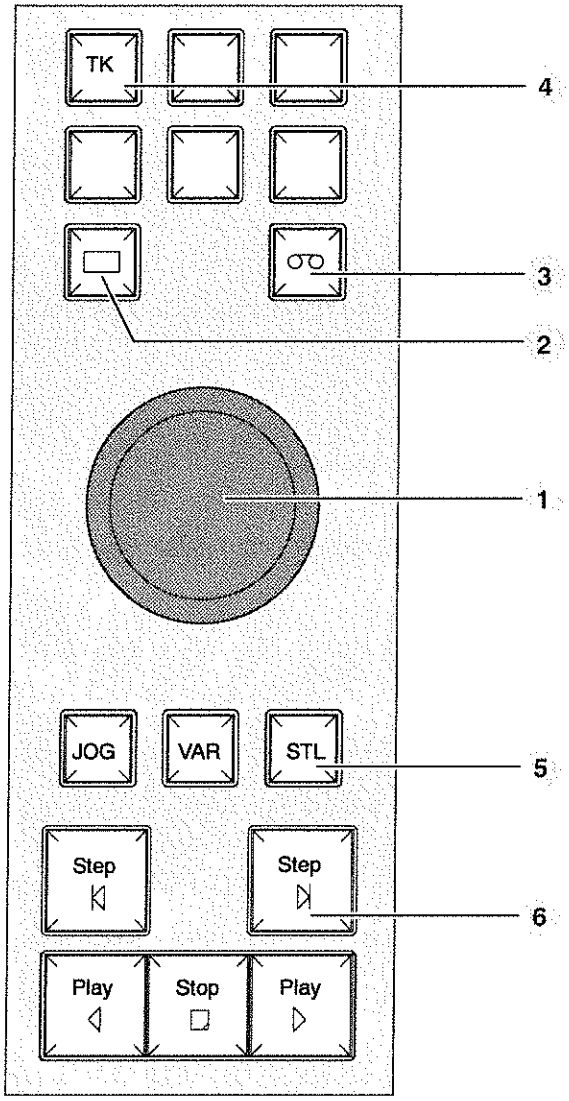


Fig. 1: Machine control section

1 Trackball

2 Display button for trackball delegation to GUI

3 Machine button for trackball delegation to machine control

4 1 button for the machine selection (TK)

5 3 buttons for Machine-Mode-Selection (Jog, Var, Shuttle)

6 5 machine-control-buttons (play, reverse play, step forward/backward, stop)

Undeclared buttons are not in use!

TK Button

To control the telecine press the TK BUTTON (Button gets lit). All transport controls are now delegated to the DataCine.

Display Button

Below the trackball on the left you find the DISPLAY BUTTON. Pressing this button delegates the trackball to the GUI (graphical user interface).

Machine Deck Button

Below the trackball on the right you find the MACHINE DECK BUTTON. Pressing this button delegates the trackball to the machine (TK) for shuttle, jog or variable speed control.

Trackball

The trackball can be used for various functions.
Delegation of the trackball is done as follows:
Pressing the DISPLAY BUTTON delegates the trackball to the next control in the current dialog which can receive trackball input (only possible if there is any control). Moving the trackball has the same effect as sliding the corresponding control on the touch-screen.
Pressing the MACHINE DECK BUTTON delegates the trackball to the selected machine (TK).
In this mode the trackball can be used as a SHUTTLE/JOG/VARI speed control.

Jog, Var, Shuttle Buttons

3 buttons for the transport mode selection (JOG, VAR and SHUTTLE) are below the trackball.
With MACHINE DECK enabled the trackball controls the telecine in the selected mode.

Step Forward, Step Backward, Play Reverse, Stop, Play Forward

The hard keys for film deck control of the telecine are located below the SHUTTLE/JOG/VARI speed buttons (Step forward, Step backward, Play, Play reverse and Stop).

3. OPERATIONAL PREPARATIONS

The sections of the chapter "Operational Preparations" have a defined order. Preceding sections are mostly precondition for the succeeding sections (such as "Perform FPN correction" **before** "Thread the film" etc.) and should therefore be considered when setting into operation.

3.1. HARDWARE CONDITIONS

GCP Installation — The Graphical Control Panel has to be connected to the Spirit DataCine.

Video and audio — The video and audio output signals are available at the respective output sockets. Depending on the intended further application, use the corresponding output sockets.

In & Out — A detailed overview on the available inputs and outputs and their applications is given in the manual "Planning and Installation".

Video reference — Depending on further use, the video reference inputs and outputs have to be connected with the remaining application units.

Time code — Depending on the application, the time code signal has to be passed on to the other units.

Keycode Reader Mounting Support — The mounting support combined with a keycode reader head serves to generate the film keycode and to insert it to the DPX data output.

Monitoring — If required, connect a video monitor for checking, and monitor both audio channels via the audio monitor outputs.

Option Phantom Transfer Engine TE 2101

Data Output — The option Data Output - as part of the Transfer Engine option - is required to provide high speed film data - DPX or TIFF format - for recording on computer workstations or Specter Virtual DataCine VDC2000.

HIPPI Serial I.F. — A HiPPI serial interface - also part of the option Phantom Transfer Engine TE 2101 - provides the high speed data transmission to a workstation / Specter via fibre optic cables.

Option GSN Phantom Transfer Engine TE 2111

Data Output — The option Data Output - as part of the Transfer Engine option - is required to provide high speed film data - DPX or TIFF format - for recording on computer workstations or Specter Virtual DataCine VDC2000.

GSN I.F. — A GSN serial interface - also part of the option Phantom Transfer Engine TE 2111- provides the high speed data transmission to a workstation / Specter via fibre optic cables and GSN Switch.

3.2. POWER-UP

The film scanner is powered up with the mains switch "Power" at the front of the film scanner (Fig. 301: **1**).

To switch on the Graphical Control Panel GCP1 (Fig. 301: **2**), press the power button **3**.
Note! The boot up sequence takes about 2 minutes! Details, see the separat GCP Customer's Manual.

To avoid EMC (electromagnetic compatibility) problems keep the rear doors always closed during operation!

Warm-up After 15 minutes operating time, all characteristics are stabilized.

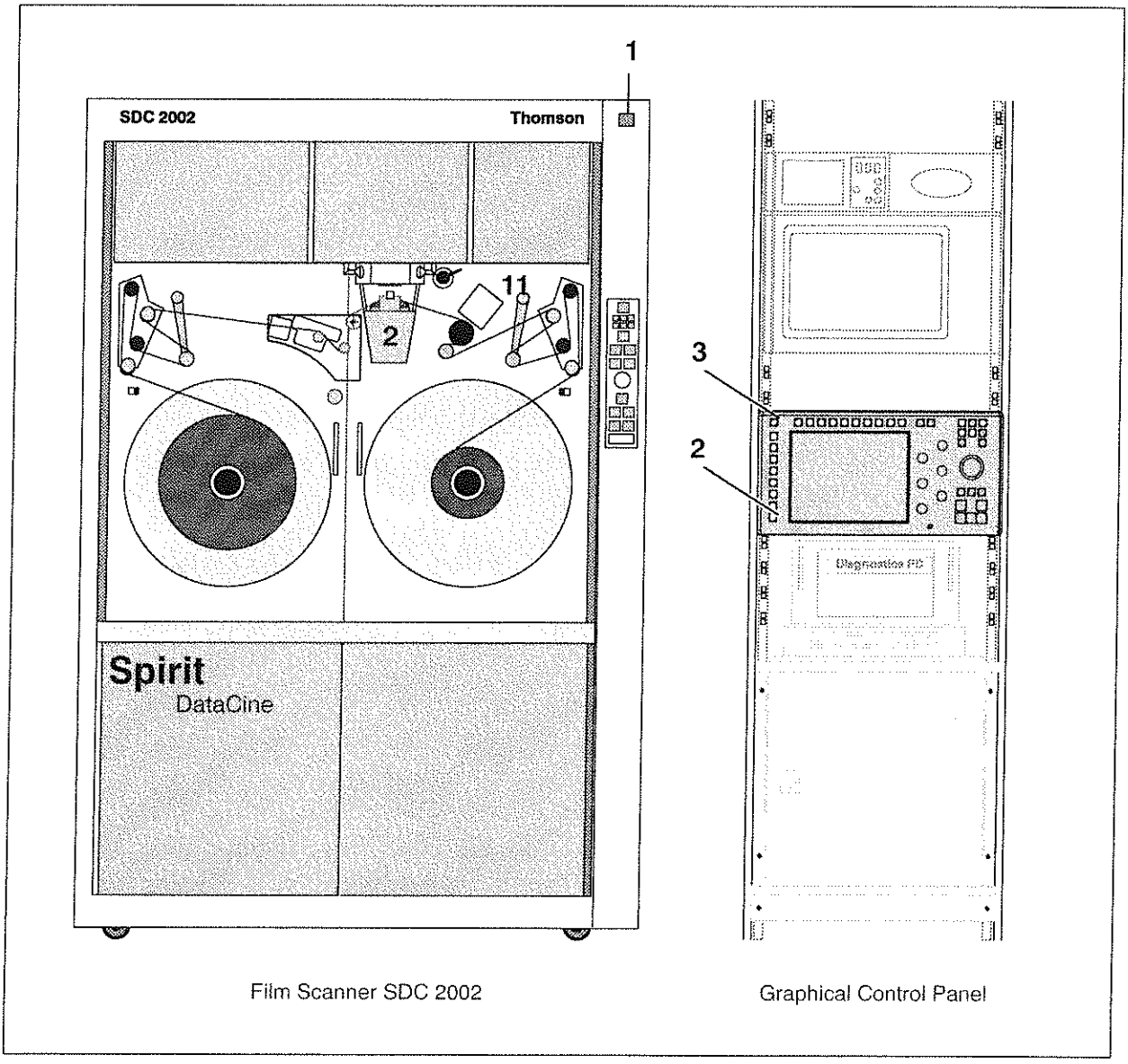


Fig. 301: Film scanner SDC 2002

3.3. BASIC ADJUSTMENTS OF THE FILM SCANNER

3.3.1. CONFIGURATION OF THE CONTROL PANEL & DELEGATION OF OPERATIONAL CONTROL

Configuration of the graphical control panel is mostly performed only once. For details, see Customer's Manual GCP.

After "power on" the display of the graphical control panel shows the power-up test, and subsequently the HOME menu.

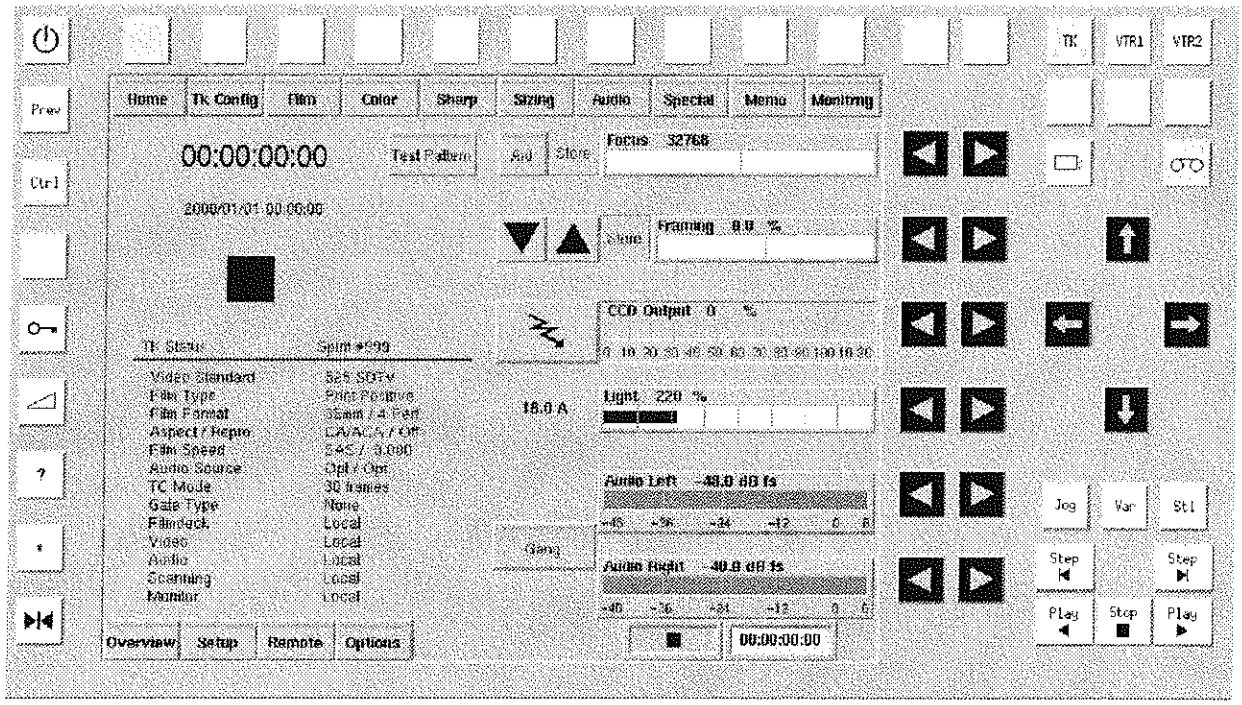


Fig. 302: Home Menu

Press once the CONTROL BUTTON to get control over the Spirit DataCine.

3.3.2. SELECT TV STANDARD

If the momentary TV standard does not correspond to the desired standard, change the TV standard as follows.

Select the main menu "TK Config", SDTV or HDTV submenu.

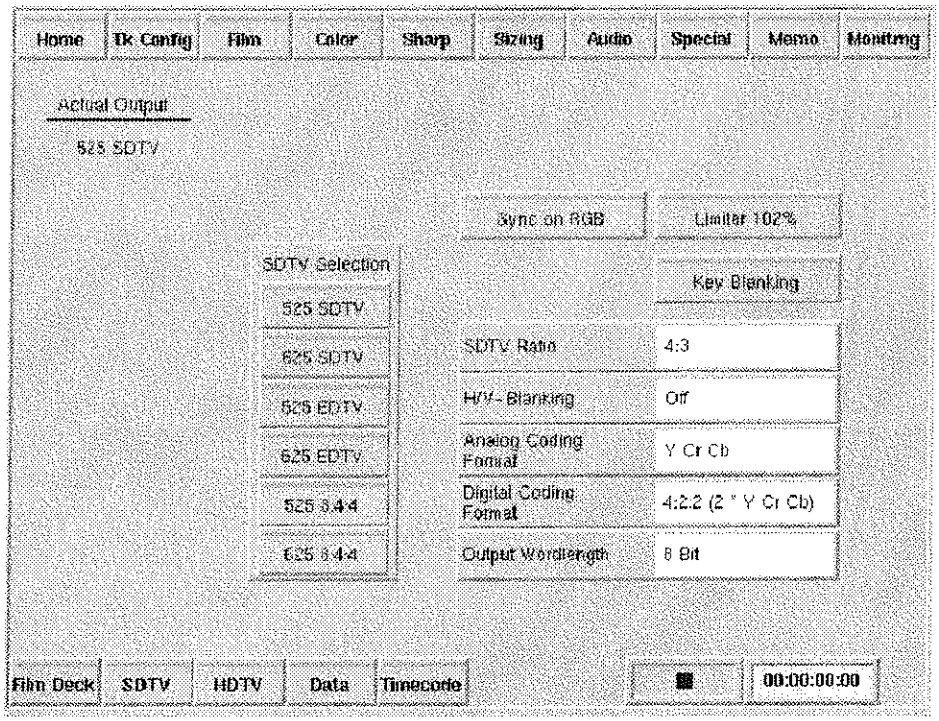


Fig. 303: :TK config menu, submenu SDTV

Window SDTV / HDTV serves to choose the TV standard.
The change of the TV standard is acknowledged by a beep tone.

Only those outputs are active, which are selected by the TV standard.
HDTV / DTV is only available, if option HDTV / DTV is mounted in Rack 3.

Note!

When switching over the TV standard, the film drive has to be in the stop mode. Subsequently, a restart of the film scanner is made with corresponding message on the display of the control panel GCP1.

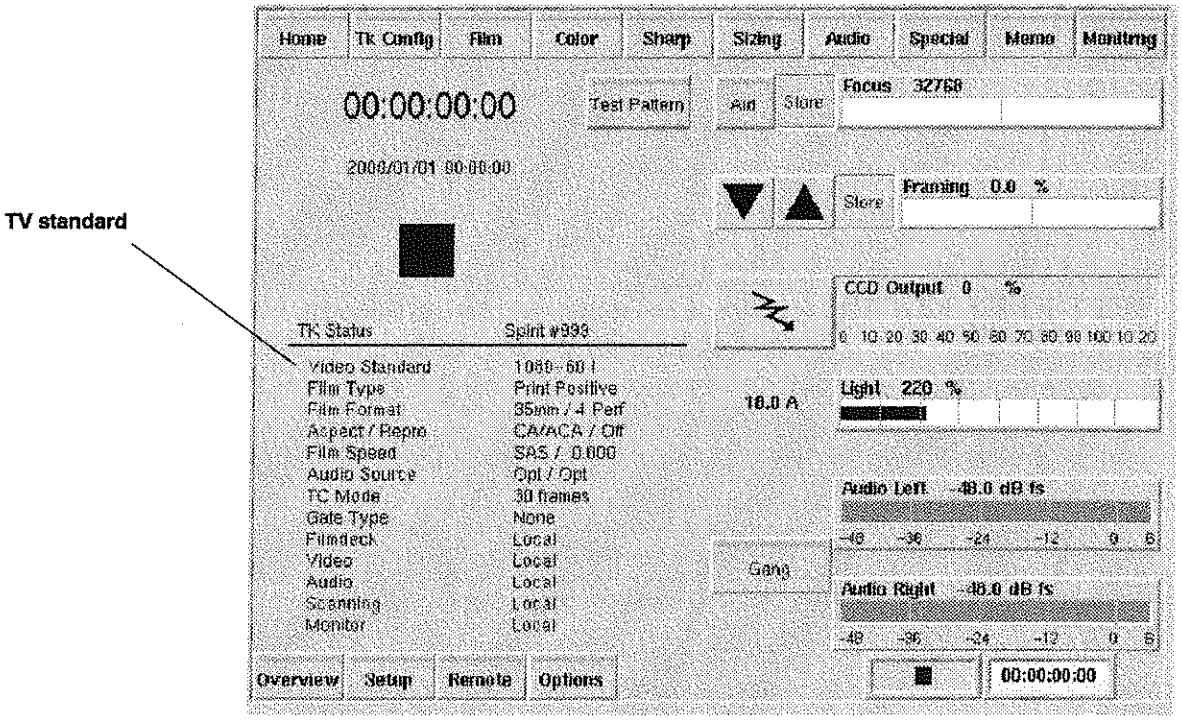


Fig. 304: : Home menu with the new TV standard

3.4. USER-SPECIFIC CONFIGURATION OF THE FILM SCANNER

3.4.1. CHANGE OPTICAL BLOCK

Changing the optical block (Super16mm, Super35mm/FA 35mm LGA - Lens Gate Assembly) **optically** matches the film scanner to the wanted film format.

Change LGA

1. Remove the threaded film from the optical block, if necessary.
2. Unlock the optical block (LGA, lens gate assembly).
   For this purpose, move the locking lever on the right of the optical block in upwards ccw direction.
3. Seize the optical block at the two handles, pull it out on its guide rails and remove it.

Attention!

When pulling out the optical block, keep a firm hold on it (approx. 8 kg)!
As soon as the optical block leaves the guide rails, it might be possible that it slides downwards.

4. Set the new optical block on the guide rails and slide it slowly towards the film deck plate until it fits.
5. Lock again the lever beside the optical block (position LOCK).
6. Open the film gate locking lever and close it again, to ensure, that the film gate is not tilt.
7. Perform FPN correction (see section 3.5.).

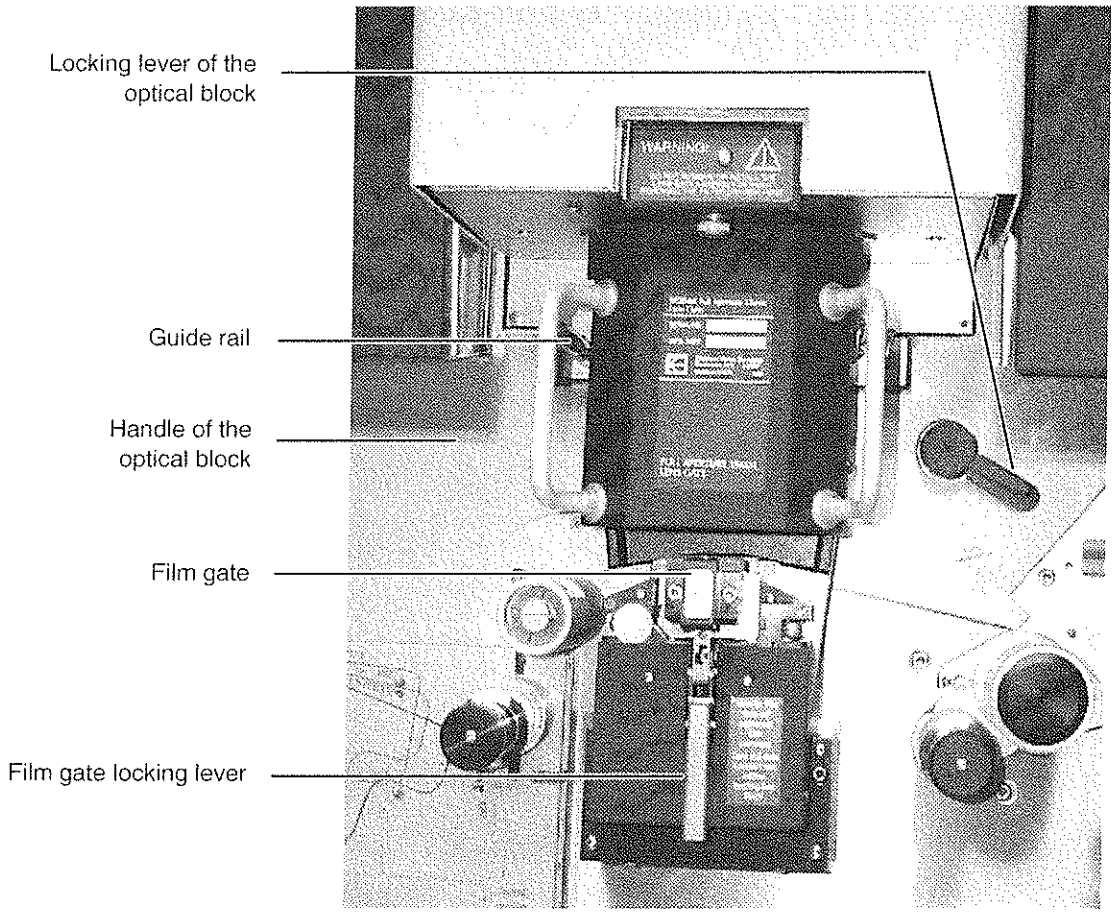


Fig. 305: Optical block of the film scanner

3.4.2. CHANGE THE FILM GATE

Super optical blocks need an additional film gate (option) when operating standard films.

Change

1. Open the film gate locking. For that reason hold the film gate locking lever at the lower end and pull it up.
2. Remove the built-in film gate.
3. Insert and lock the new film gate.
4. Perform FPN correction (see section 3.5.).

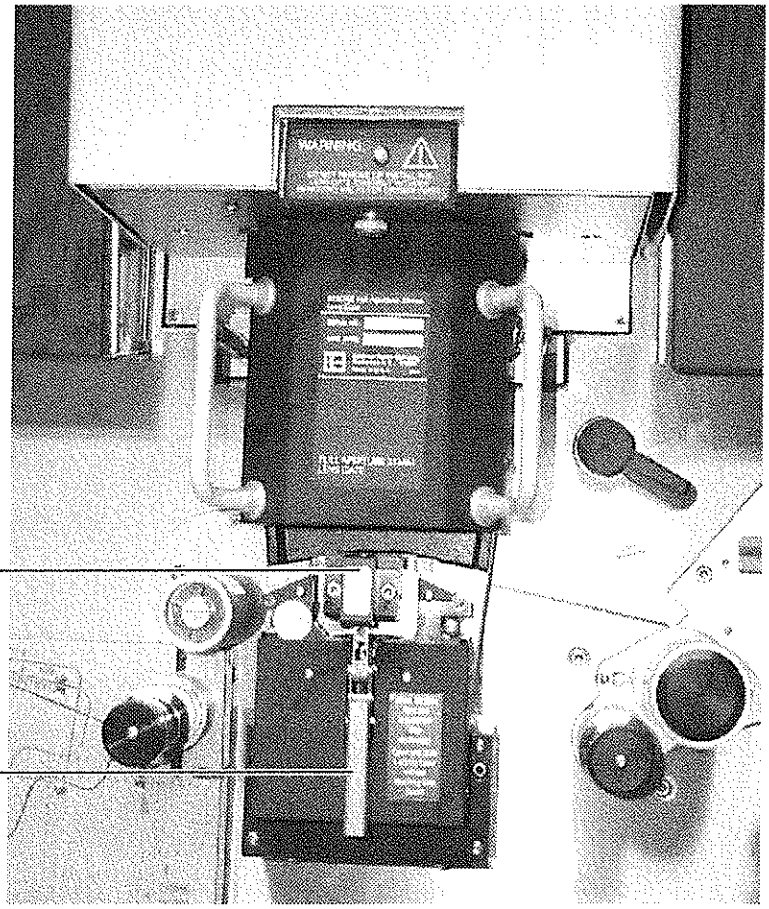


Fig. 306: Film gate of the film scanner

Note!	***Film Gate self-adjustment after exchange: Open the locking lever and close it again without touching the Film Gate.***

3.4.3. USING EFFECT FILTERS

Precautions!

- Insert a filter drawer into the filter drawer slot with filter facing up and the filter side heading as shown in the figure below.
- Take care of not fastened filters or hold downs. These can drop into the AIH or LGA and may cause damage to the system.
- Do not insert any foreign object into the filter drawer slot. This could result in a malfunction and a damage to the unit.
- To ensure the correct position of the filter and electromagnetic compatibility, the filter door must always be installed during operation.
- Do not remove or install the Lens Gate Assembly without removing the filter drawer first.
- Use only filter drawers from Thomson. Otherwise danger of damage to the focus system.
- Filter drawer can not be installed if the focus slide is in the range of 0 up to 15,000. Set focus to the value >15,000.

Insert a filter drawer into the filter drawer slot with filter facing up and the filter side heading as shown below!

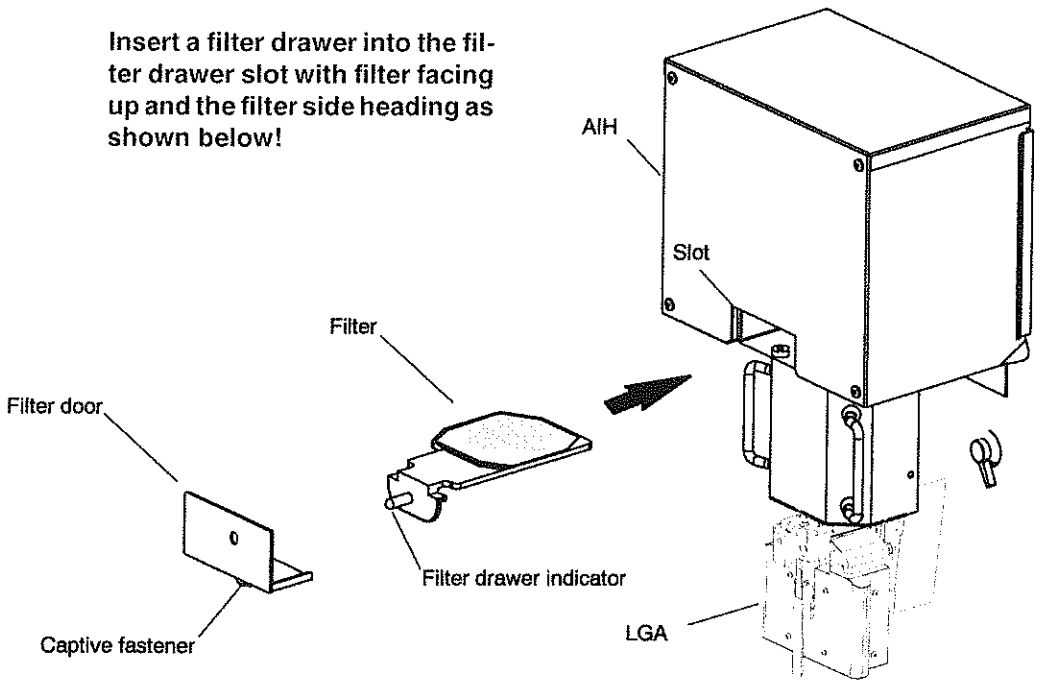


Fig. 307:

Attention!
Never insert the filter with the filter facing down!

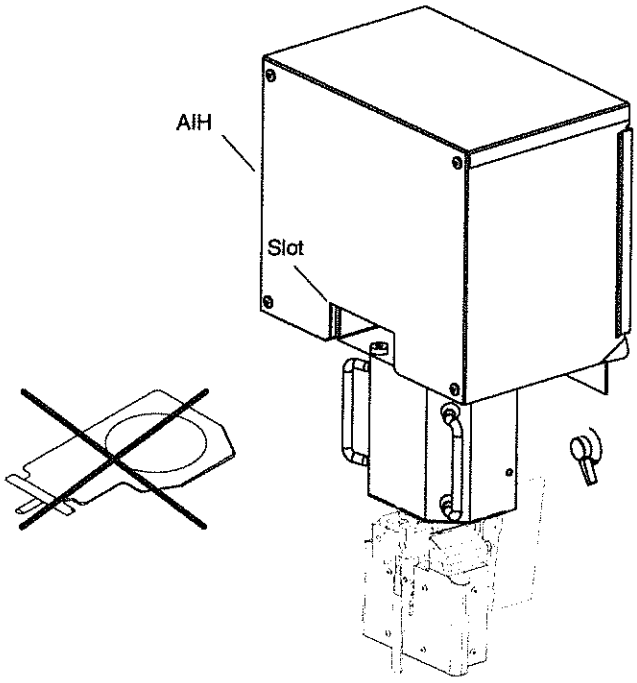


Fig. 308:

Note!
The filter drawer is correctly installed when the white filter drawer indicator is visible!

To ensure the correct position of the filter and electromagnetic compatibility, the filter door must always be installed during operation.

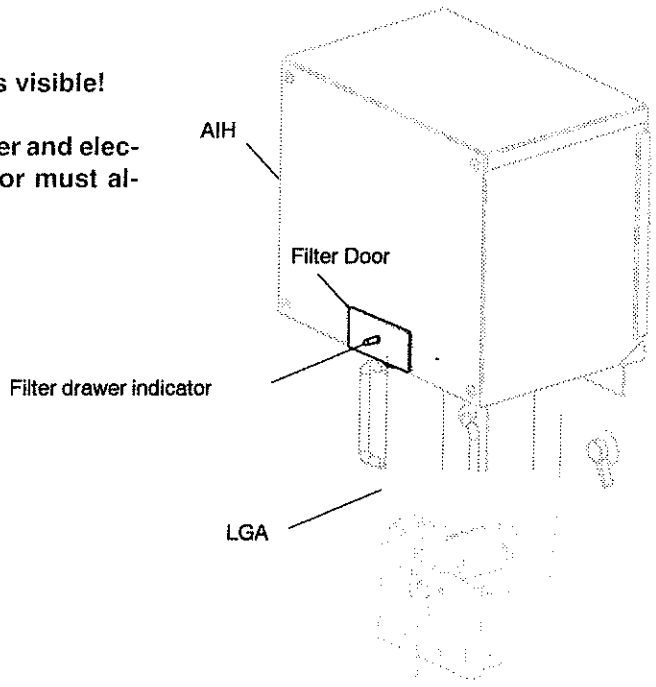


Fig. 309:

1. General

The Effect Filter Case FH 6910 facilitates the usage of optical effect filters for the Spirit DataCine film scanner. It consists of a selection of drawers, which position filters in the optical path between the projection lens and the CCD sensors.
14 different kinds of supermist filters are provided with the upgrade kit. Each filter is protected in its own drawer. In addition six drawers, six filter hold downs and two optical flat filters are available to produce custom-built effect filters.

The Effect Filter Case FH 6910 is part of the basic accessory SDC 2002 and contains the following parts:

Pos.	Pcs.	Designation
1	1	Effect filter case
2	14	Effect filter drawer with White Supermist filter: 0.25, 0.5, 1.00, 2.00, 3.00, 4.00, 5.00 Black Supermist filter: 0.25, 0.5, 1.00, 2.00, 3.00, 4.00, 5.00
3	6	Filter drawer with double-sided tape (w.o. filter)
4	6	Filter hold-down with double-sided tape
5	2	Optical flats

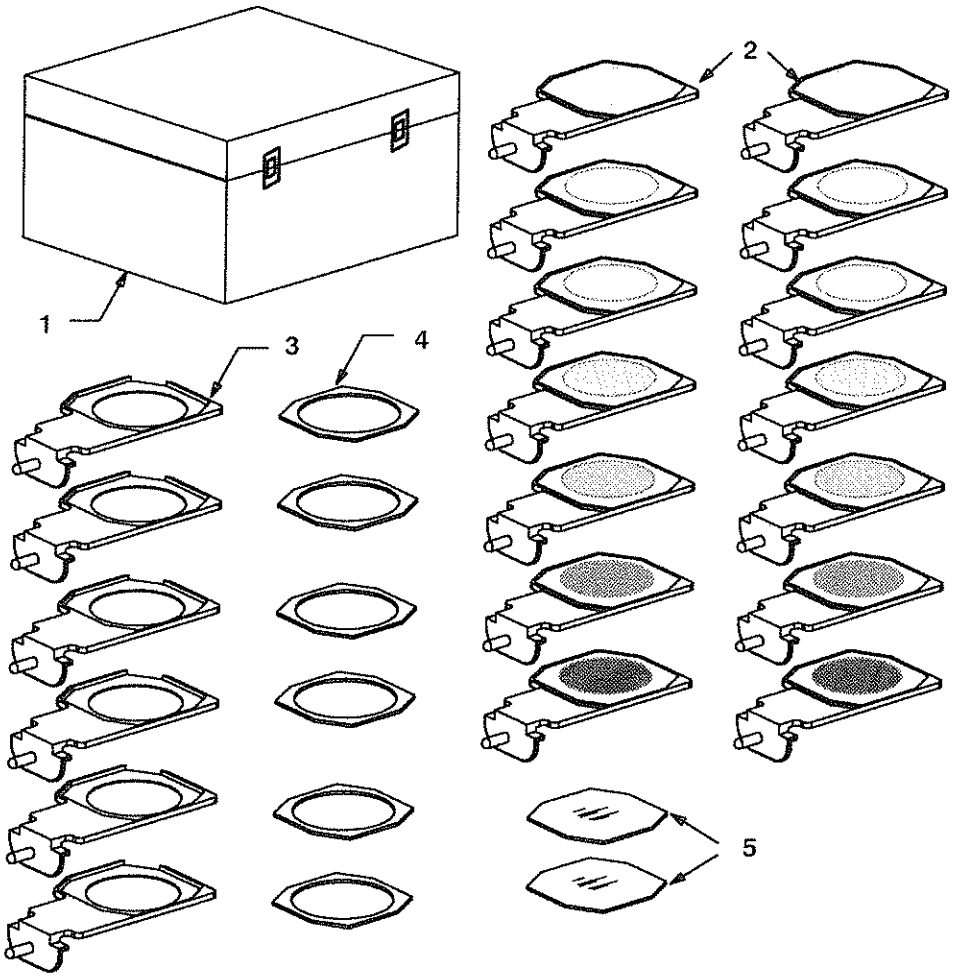


Fig. 310: Effect Filter Case cpl. FH 6010

Filter types

The type of the filter **White Supermist** or **Black Supermist** can be identified at the front label of the drawer.

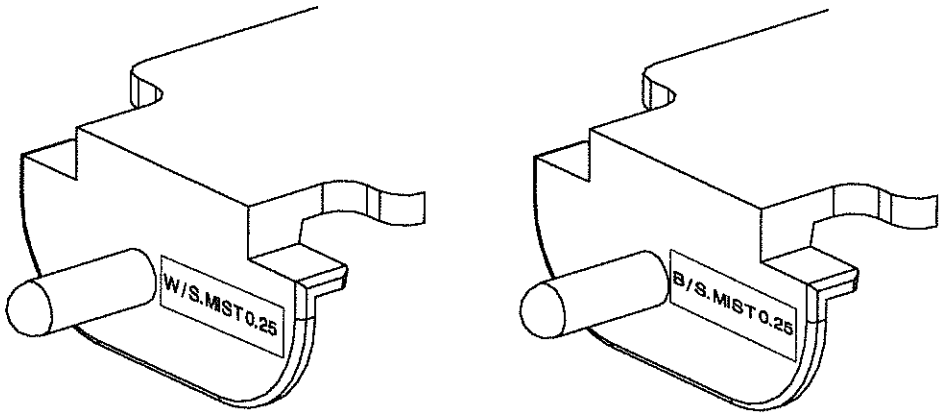


Fig. 311:

2. **Additional Filter and Filter Drawer Set**

a. Filter Drawer Set
(5 pcs, w.o. filters)
is optional available.

Spare part order no.: **3 119 100 288**

b. Filters

Please order spare or additional filters directly from:

South London Filter LTD.
Linton House Unit 112
164-180 Union Street
SEL1 OHL London
Phone: +44 171620 3060

3. **Mounting Filter & Filter Drawer**

Preparation of customer-prepared Filter

Prepare filter material according to the following measurements:

Filter size:

- Area 63.5mm x 63.5mm [2.5 in x 2.5 in] with sloped edges
- Maximum thickness used with filter hold-down 0.65 mm [0.025 in]
  used without filter holder 2.0 mm [0.08 in]

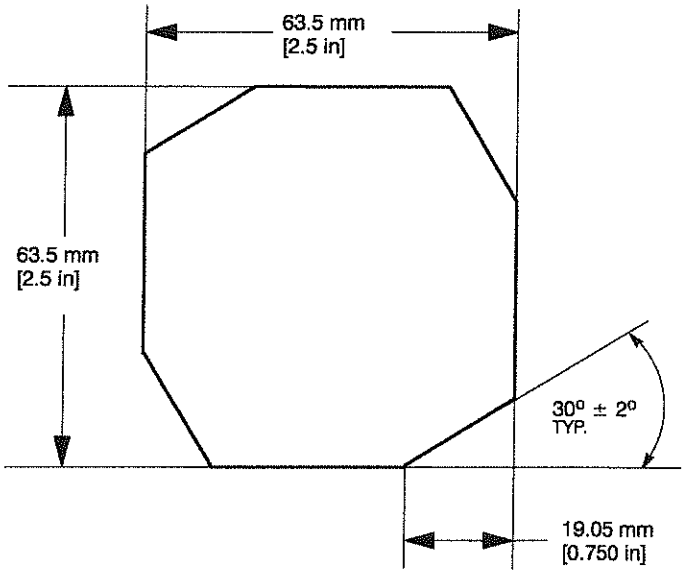


Fig. 312:

Attention!
Pay attention to the right position of filter and filter hold-down. Danger of damaging both when the focus slide moves down!
The area of the filter material must not surmount the filter drawer edges.
Use only filter drawer from Philips.

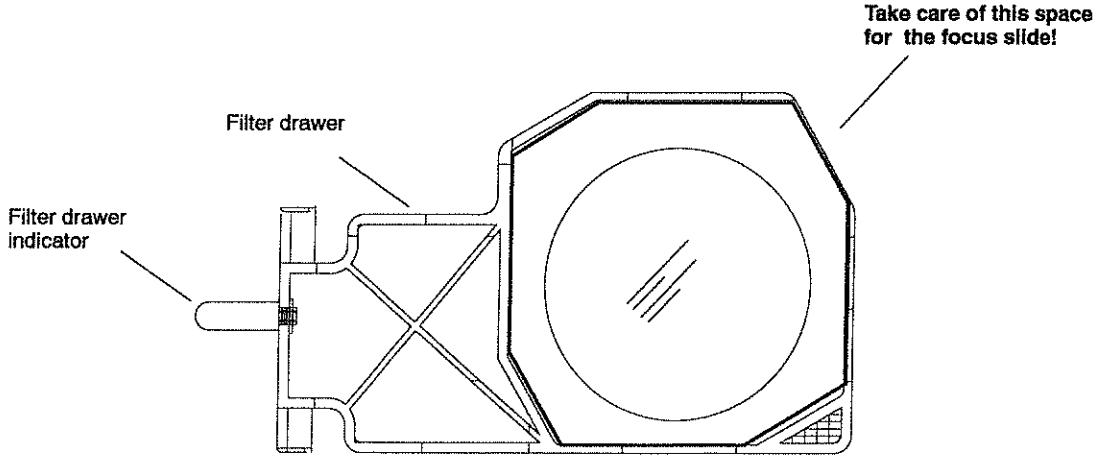


Fig. 313:

4. **Insert Filter into Filter Drawer**

Fixing Filter only with Filter hold-down (for test purposes only)

Insert a prepared filter into the filter drawer and fix it at the drawer with the filter hold-down as shown in figure Fig. 314: . Do **not** remove the tape protection foils from the filter drawer and filter hold-down.

Note! The height of filter and filter hold-down must not surmount the filter drawer upper edge.

Caution!
Take care of not fastened filters or hold-downs. These can drop into the AIH or LGA and cause damage to the system!

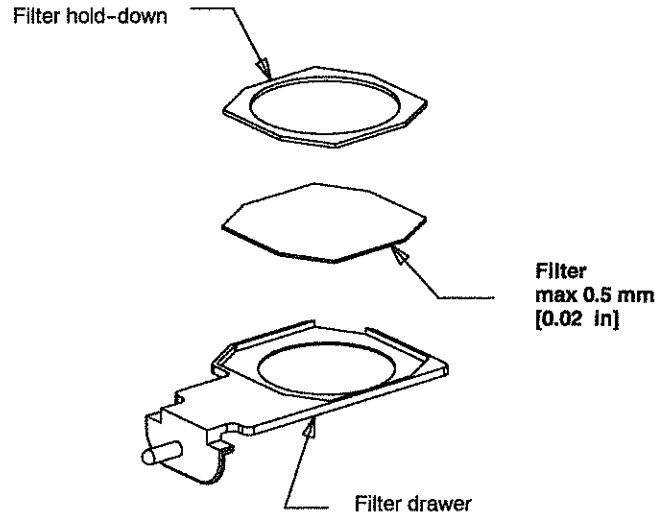


Fig. 314:

5. **Fixing Filter at Filter Hold-down with double-sided Tape**

Insert a prepared filter into the filter drawer and fix it at the filter hold-down with the double-sided tape as shown in figure Fig. 315: . Do **not** remove the tape protection foil from the filter drawer.

Note!
The height of filter and filter hold-down must not surmount the filter drawer upper edge.

Caution!
Take care of not fastened filters or hold-downs. These can drop into the AIH or LGA and cause damage to the system!

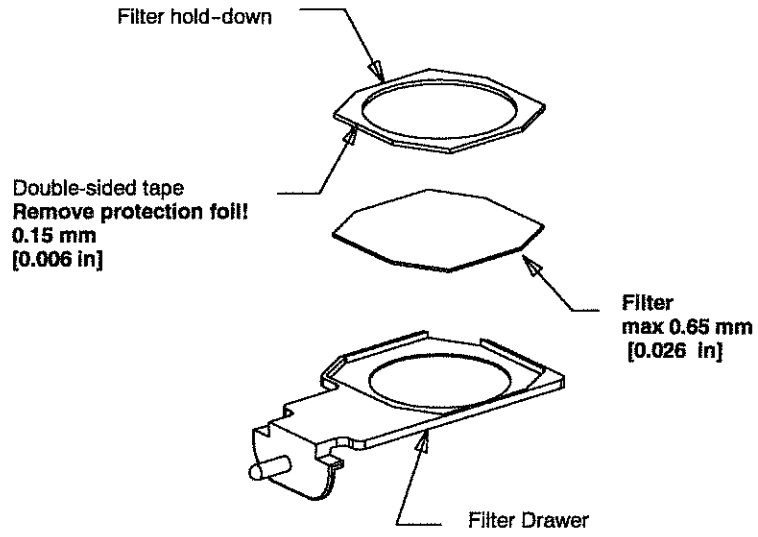


Fig. 315:

6. **Fixing Filter with double-sided Tape**

The filter drawers are provided with a double-sided adhesive tape. This tape serves for fixing a filter permanently in the drawer.
Insert a prepared filter into the filter drawer and fix it with the double-sided tape as shown in Fig. 316: . Before doing this, remove the protective foil from the double-sided tape in the drawer.

Important!
The thickness of filter material must not surmount the filter drawer upper edge.

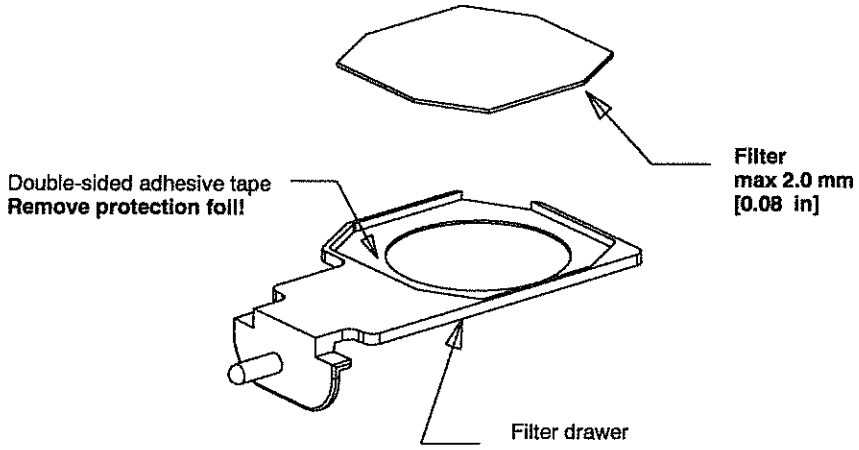


Fig. 316:

7. **Insert Filter Drawer**

- Adjust Focus to the value >15,000
  Menu Home - focus
  Filter drawer **cannot** be inserted if the focus slide is in the range of 0 up to 15,000.

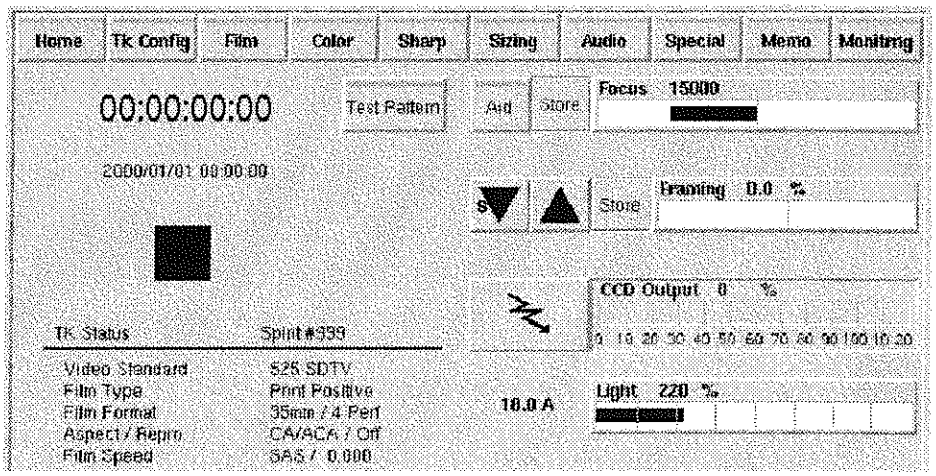


Fig. 317:

- Remove the filter door from the AIH, for this purpose loosen the captive fastener, see Figure Fig. 318: .
- **Insert the filter drawer into the filter drawer slot with filter facing up and the filter side heading as shown in the figure below.**

Attention!
Do not tilt the filter drawer, if the filter is only fixed with the hold-down and not fixed with the double-sided tape! Filter could drop into the system.

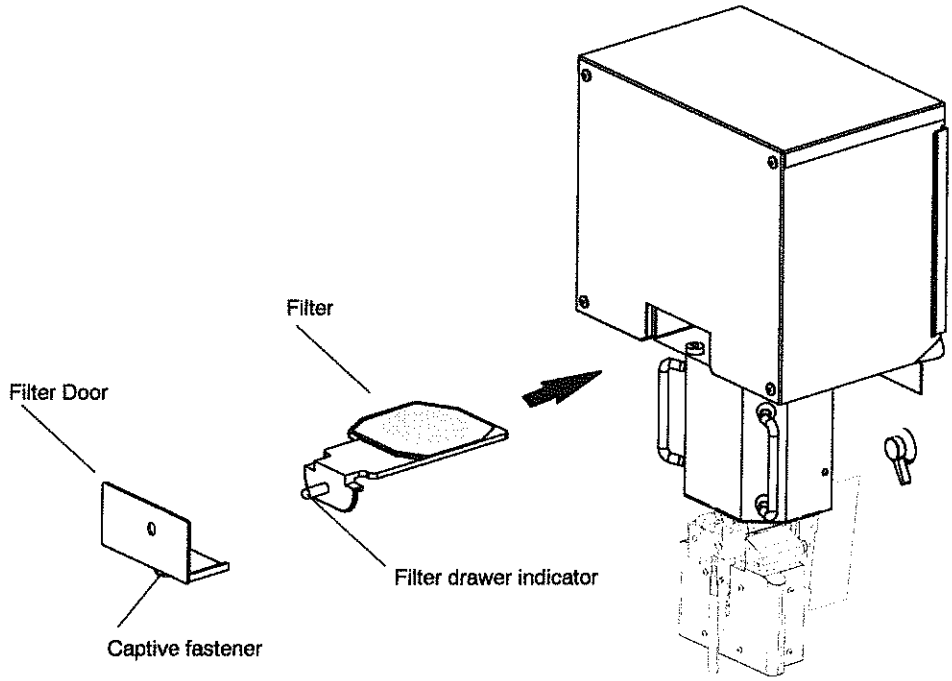


Fig. 318:

- Re-install filter door.
  To avoid damage to the focus mechanism and filter drawer and to ensure electromagnetic compatibility, press the filter door firm against the sealing tape (around the compartment opening) and tighten it with the captive fastener.

Warning!
To ensure the correct position of the filter and electromagnetic compatibility, the filter door must always be installed during operation.

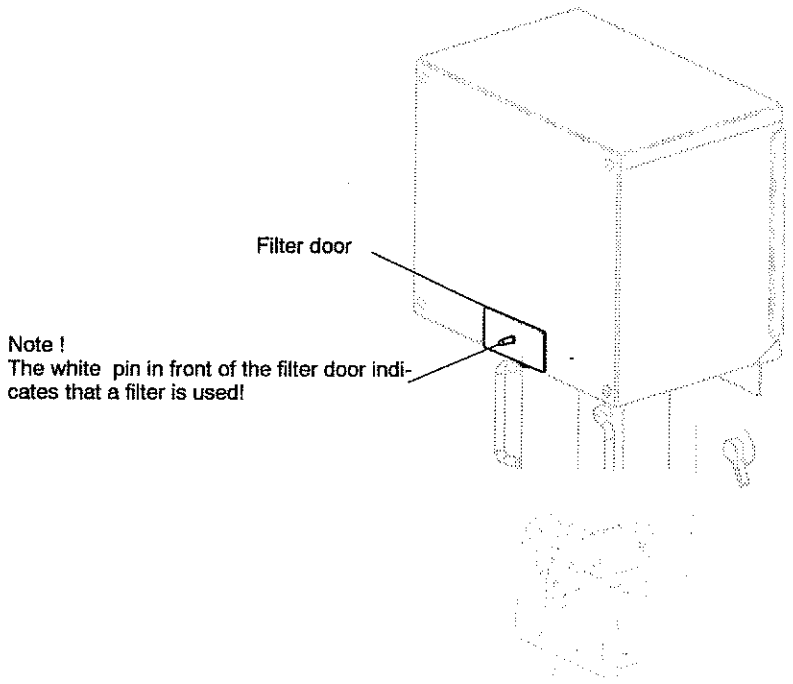


Fig. 319:

Warning!

Danger of damage to the filter drawer.

Do not remove or install the Lens Gate Assembly without removing the Filter Drawer first!

Important Note with regard to FPN Correction!

Please ensure, that no filter drawer is inserted into the LGA during

- Power up of film scanner SDC 2002 (FPN correction is mandatory)
- Reset of SDC 2002 from the Control Panel (FPN correction is mandatory)
- FPN correction

Normal FPN correction should always be done without the effect filter to ensure perfect correction. If FPN is performed with a filter inserted, FPN correction will only be correct for this special filter.

8. **Adjust Focus**

The usage of light effect filters can cause de-focussing of the system. It is recommended to adjust the focus of the AIH when an effect filter is being installed or changed.

Setting

The focus slider controls the focus servo in the film scanner.
Foccussing can be done either with the digipot control or by sliding on the touchscreen, for details see chapter 3.8. "Adjust Focus"

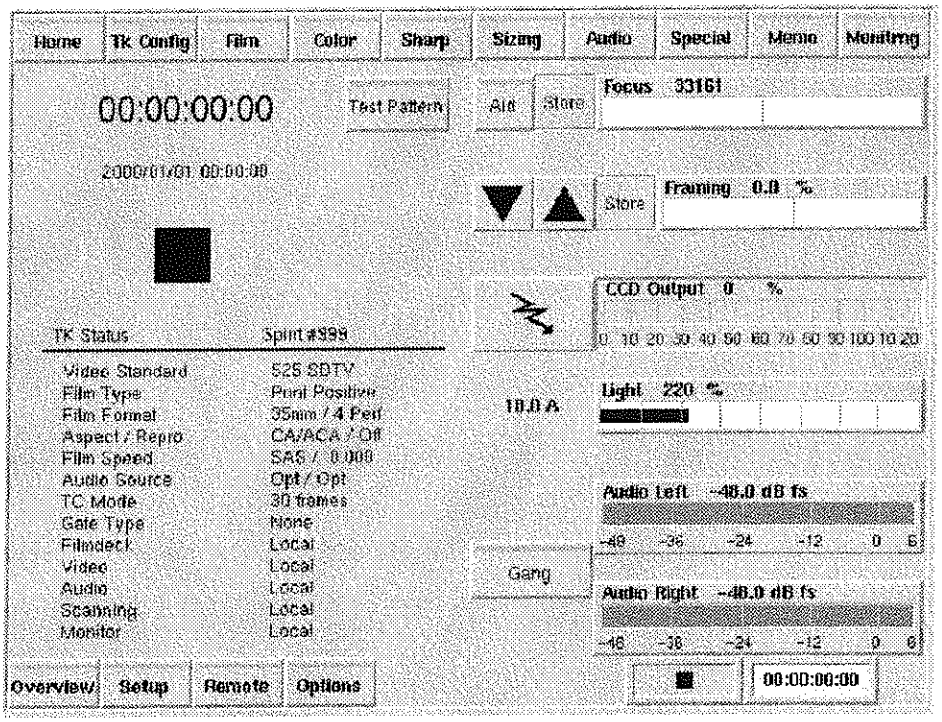


Fig. 320: Home menu with Focus slider

Storing

Hitting the the STORE button opens the a dialog window. With O.K. your new setting will be stored.

9. Trouble Shooting

Remove Parts dropped in

In case of parts have been dropped in to the inside of the AIH system, take them out as follows (Figure Fig. 321:

- Remove the Lensgate Assembly (LGA) and take out the parts which have dropped in.

if necessary

- Remove the cover of the AIH system and take out parts which have dropped in.

- Re-install LGA and AIH cover

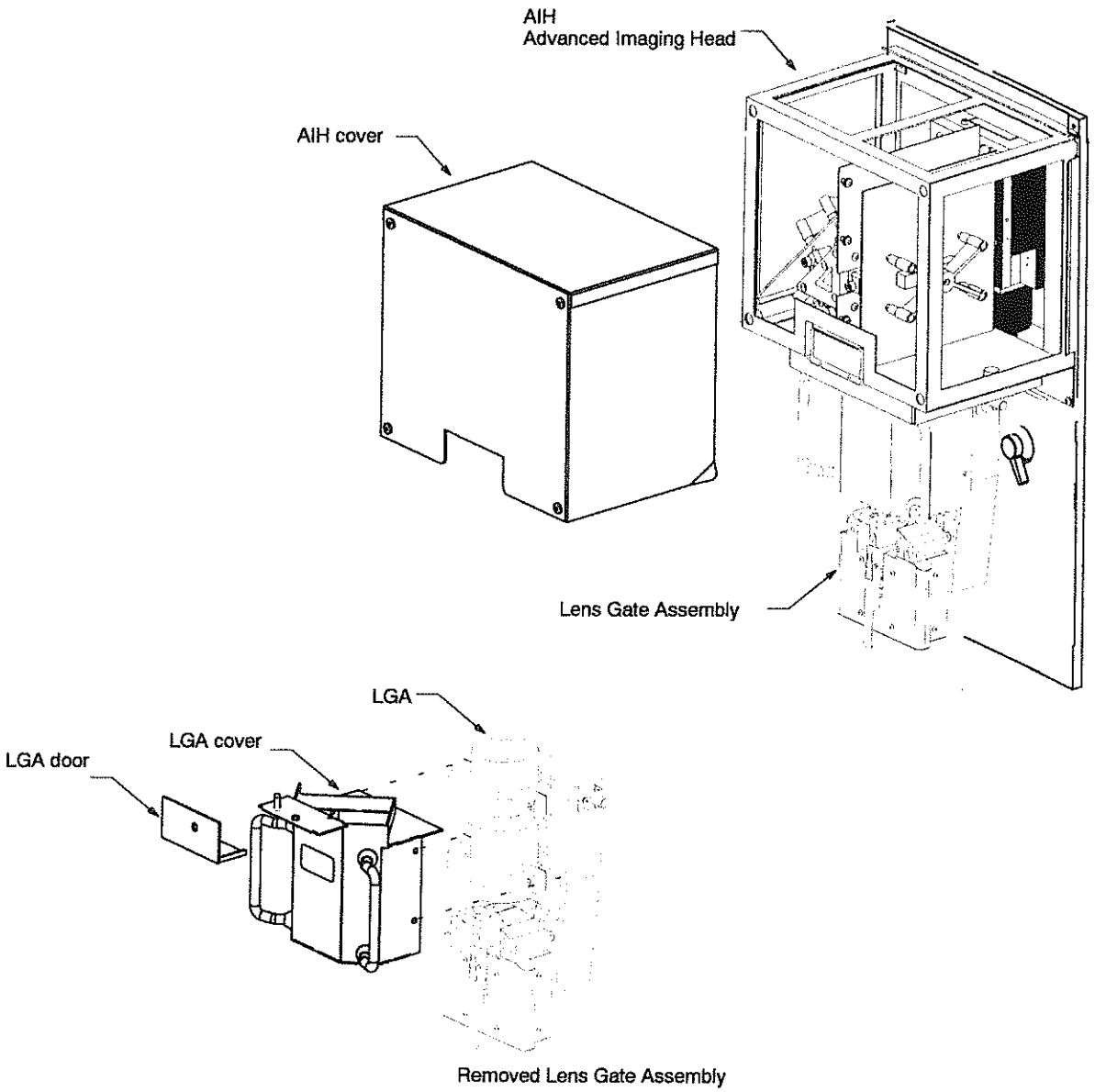


Fig. 321: Access to LGA and AIH

Blocked up Filter

In case a filter is blocked up in its compartment and the "remote focus slide" is locked, release the focus slide by means of the GCP menu "Diagnosis" Focus Release" button.

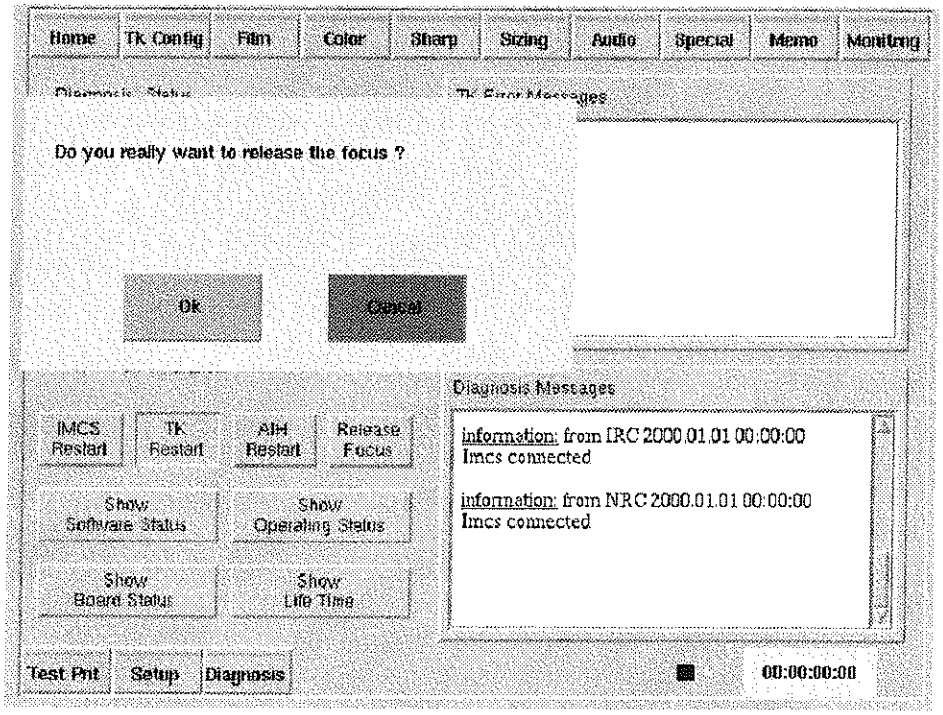


Fig. 322: Monitoring menu with submenu Diagnosis - Release Focus button

3.4.4. SETUP FILM DECK

Set filmdeck settings in th main menu "TK Config"

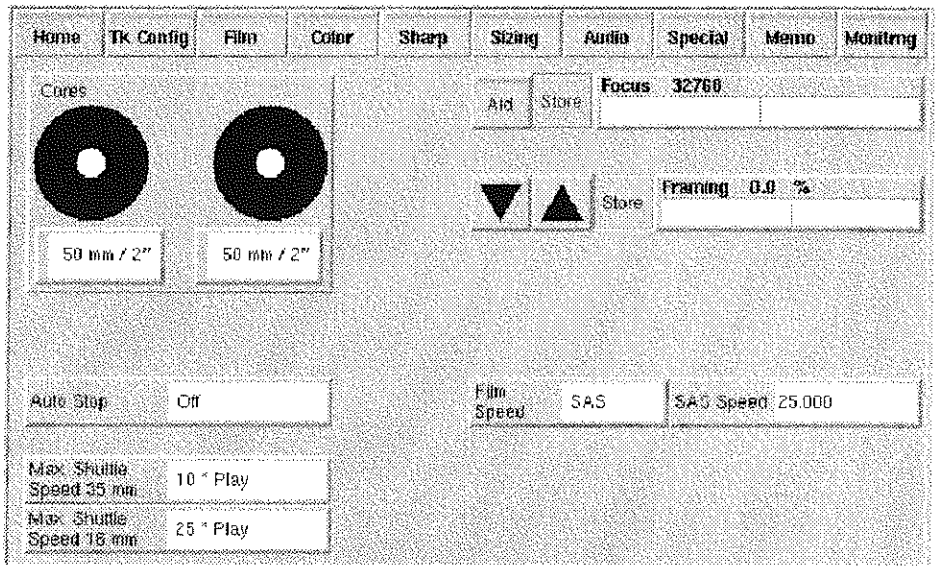


Fig. 323: Menu TK Config

Set
Core diameter
Auto Stop
Max Shuttle Speed 35mm
Max Shuttle Speed 16mm in main menu "SETUP".

Configuration possibilities concerning film deck are to be found in the GCP Manual.

3.4.5. SETUP FILM

Open the main menu Film and adapt the film scanner to the film to be played. Use the button "Filmtype"

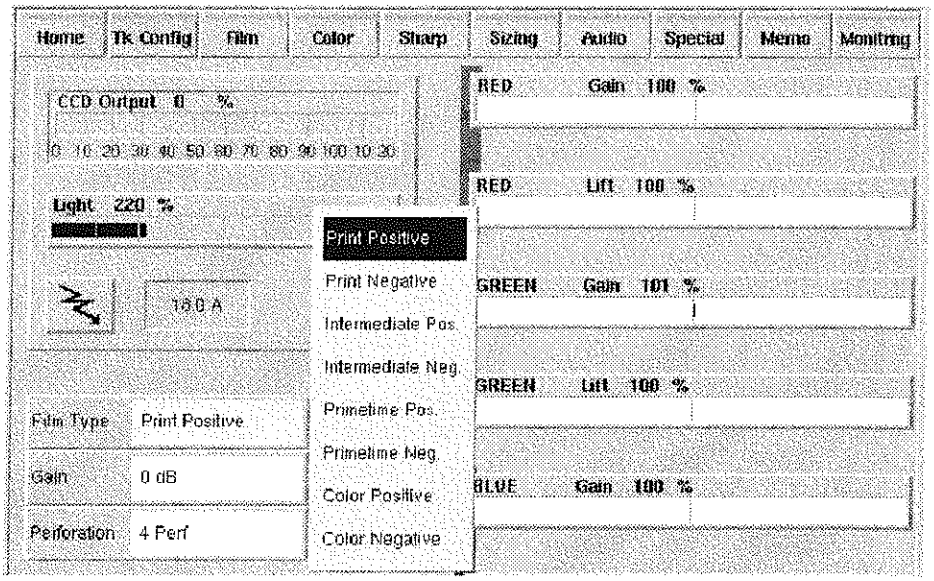


Fig. 324: Film menu

Configuration possibilities and explanations are to be found in the GCP Manual.

3.4.6. SELECT TV RATIO 4:3 / 16:9

Open then main menu TK Config, select submenu SDTV

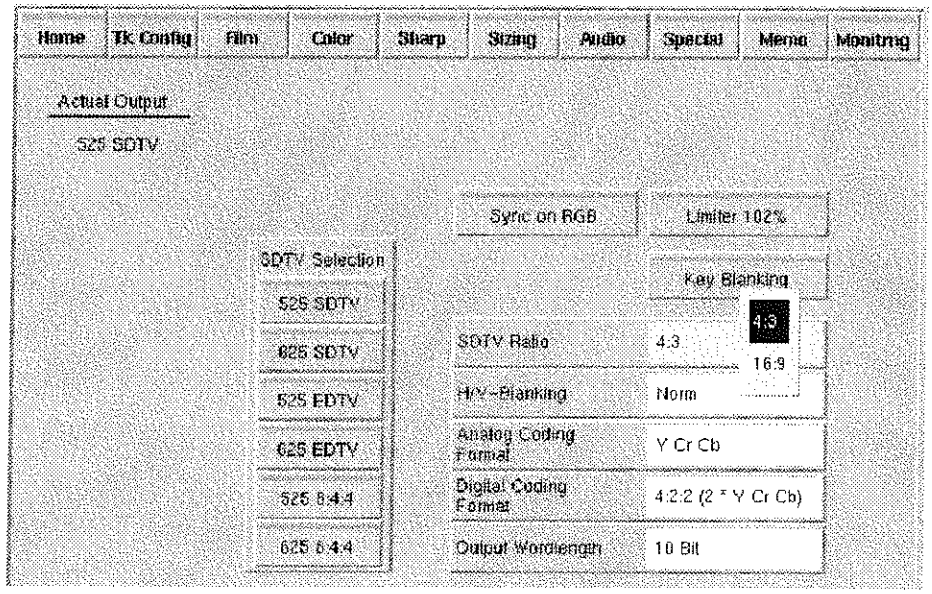


Fig. 325:

Press button "SDTV Ratio" and select 4:3 or 16:9.

3.4.7. SELECT SPEED

Open then main menu TK Config

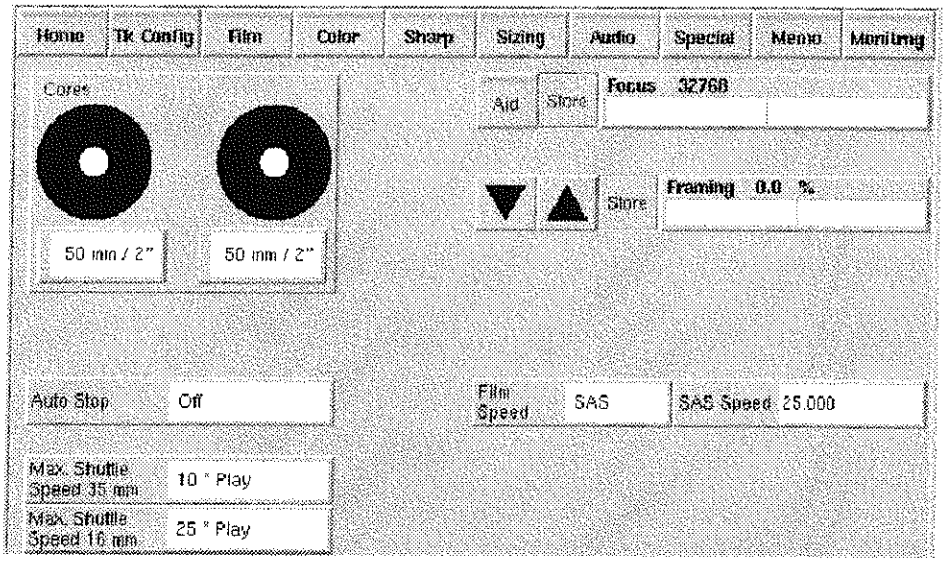


Fig. 326:

Select or adjust a fixed (or a variable) film speed for the film scanner.
Selection of the film speeds and explanations, see GCP manual.

3.5. PERFORM FPN CORRECTION

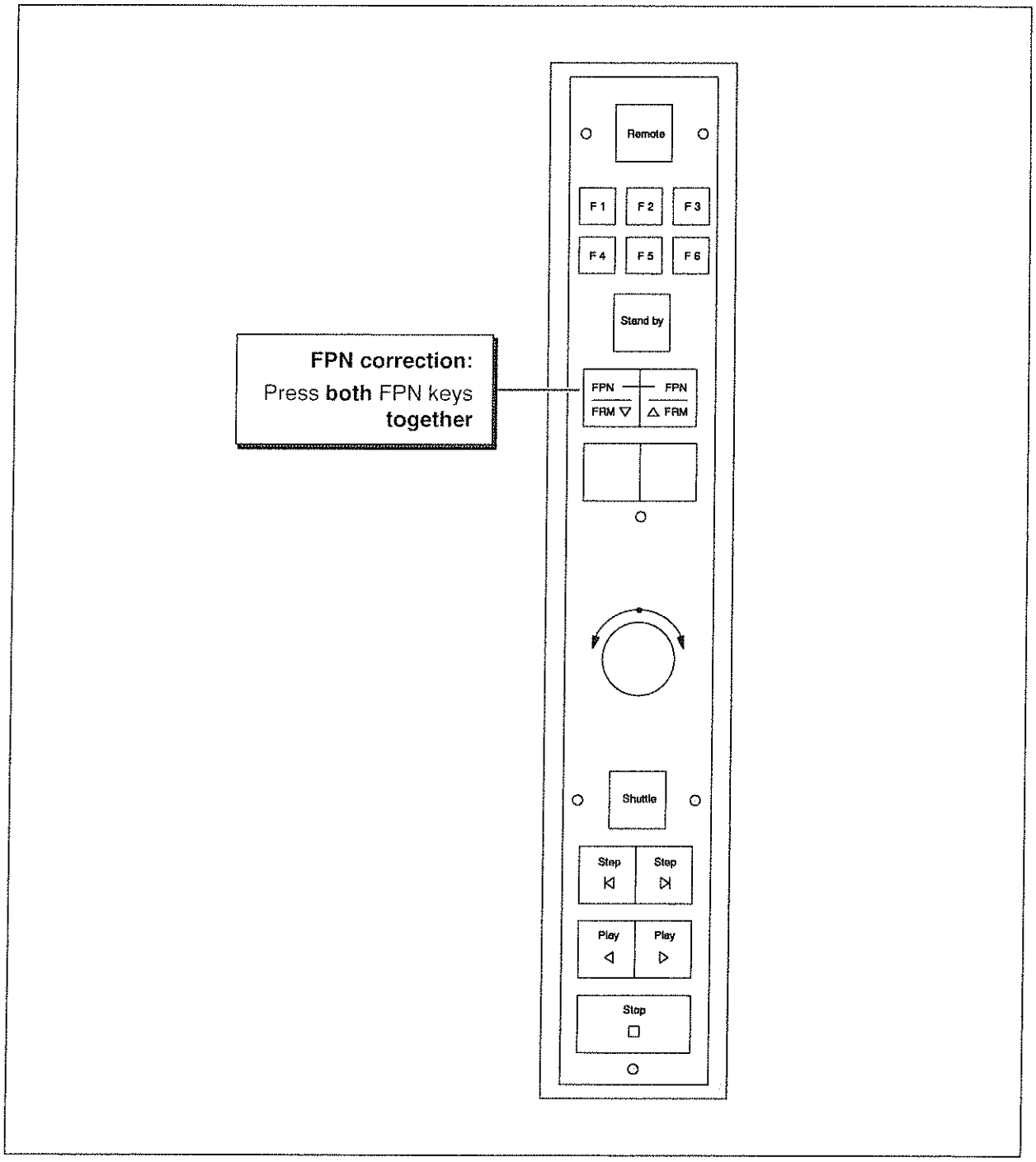


Fig. 327: Local control panel of the film scanner

Performing a FPN (Fixed Pattern Noise) correction effects an automatic noise signal compensation in the white as well as an automatic white balance adjustment.

FPN (Fixed Pattern Noise): - noise signal in the white signal

FPN conditions:

1. Perform FPN the first time after a "warm up" of about 15 minutes.
2. Perform FPN before threading the film (FPN correction with film: picture adjustment useless and thermal film damage possible).
3. Repeat FPN, if the environment temperature changes by more than ±5°C.
4. Repeat FPN to compensate illumination level losses, if the environment temperature changes by more than ±2°C.

With super 16mm optical block:

1. Perform FPN always after having changed the iris setting.
2. Use 6 dB gain, if the iris is not opened fully.
3. No FPN can be performed, if the iris is closed.

Performing the FPN correction:

Press **both** FPN keys **together** (Stand by OFF).
During the automatic FPN correction (duration approx. 2 minutes) both FPN keys are lit.

Hint!

If both FPN keys blink, a FPN correction has to be performed.

Keys will blink:

1. After switching on the film scanner
2. After changing the optical block
3. After changing the film gate

Note!

S8mm Film Scanning

Performing FPN correction for S8mm film scanning, see optional manual "S8mm Scanning".

3.6. THREAD THE FILM

Thread the film according to the film threading path printed on the film deck.
Before the film can be threaded, the following preparations have to be made.

3.6.1. DEFINE WINDING DIRECTION

The both switches A/B on the film deck are to be set in position A (= PLAY position) for normal film operation. During operation both film reels wind anti-clockwise.

Position B is used only for rewinding a film wound side-inverted.

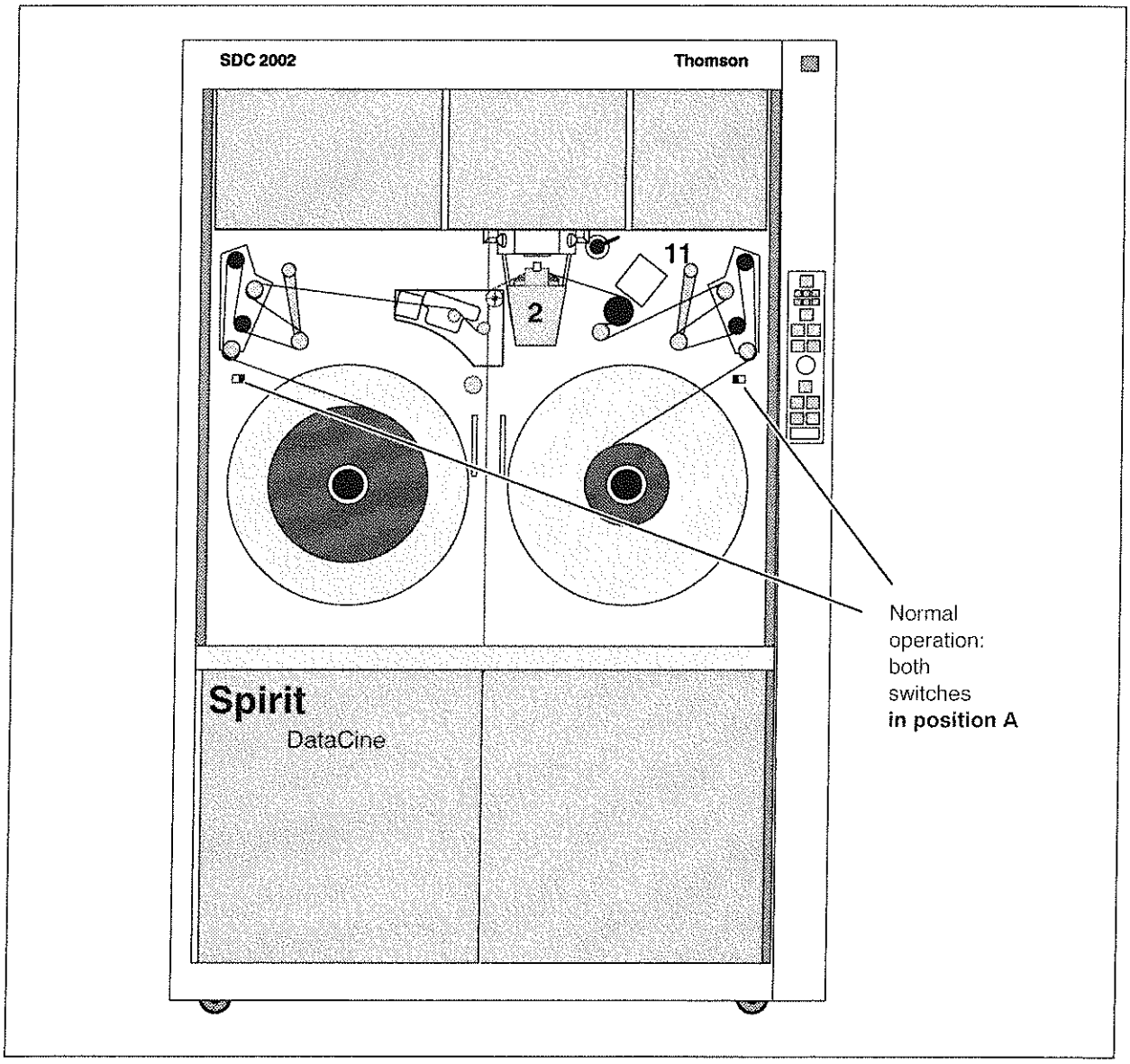


Fig. 328: Film threading path

3.6.2. USING FIXED WINDING PLATES

Two fixed winding plates can be mounted on the filmscanner. To adapt any filmtypes to the winding plates use the inlays for bobbins or the inlays for reels as well as the two locking devices. The inlays for 16/35mm films are delivered with the filmscanner or can be ordered separately (9mm spindle= FH6609 / 8mm spindle FH6608). The inlays for S8mm films are optional.

3.6.3. MOUNT FILM ROLLS

Mounting film rolls

1. Remove the complete locking device from the reel spindle.
   In addition, pull the release ring towards the release button.

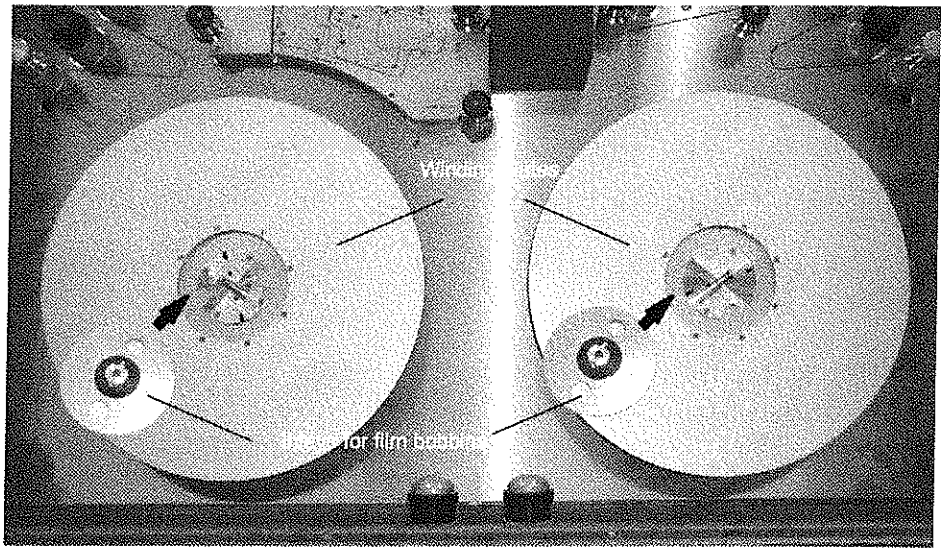


Fig. 329: Fixed winding-sheets with bobbin inlays

2. If the film is on a bobbin, the inlays for bobbins have to be mounted on both fixed winding plates.

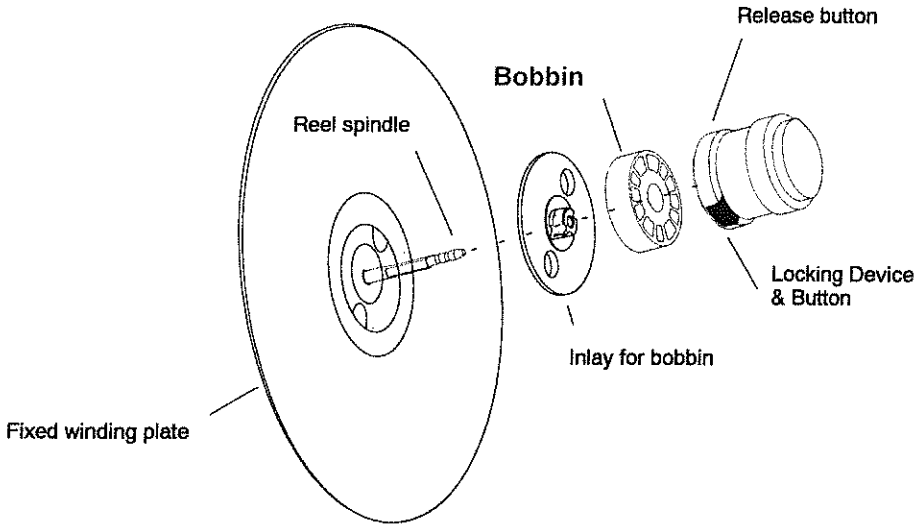


Fig. 330: Mounting film rolls with bobbin

3. Plug in the film bobbin onto the carrier of the inlay.
4. Slide the locking device onto the reel spindle until it locks in with an audible click.

Attention! When operating with **bobbins**, the inner shaft of the locking device has to **protrude**, otherwise press the locking button and the shaft will jump out.

3.6.4. MOUNT FILM REELS

If the film to be played is a film reel, the full film reel has to be mounted on the left-sided reel spindle and the empty film reel on the right-sided one.

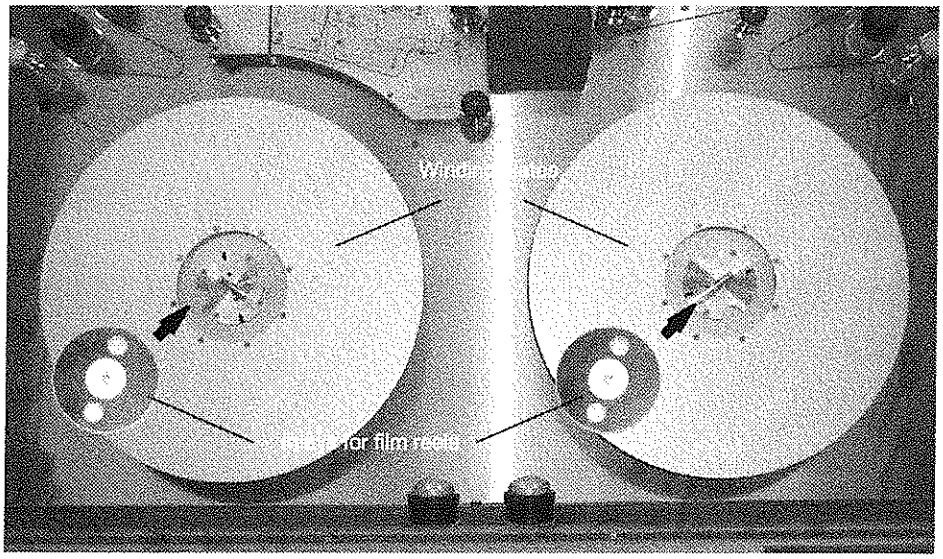


Fig. 331: Fixed winding plates with bobbin inlays

1. Remove the complete locking device from the respective reel spindle. For this purpose, pull the release ring towards the release button.

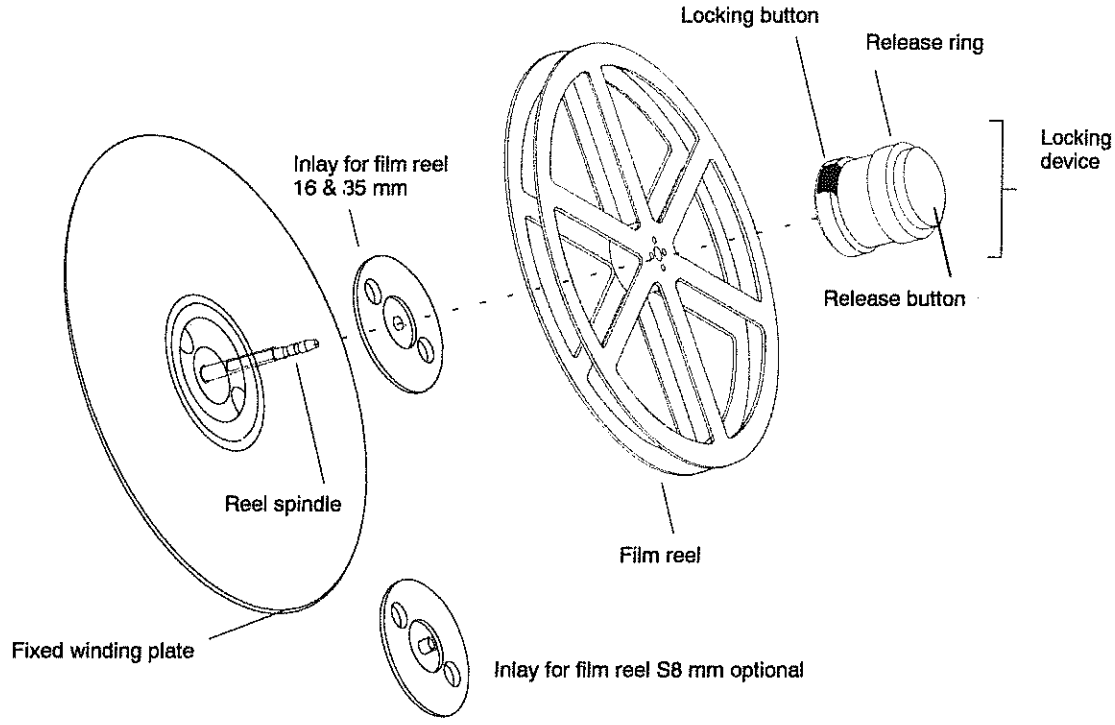


Fig. 332: Mounting the film reels

2. Mount the reel inlay to the fixed winding plate (on each side)
3. Slide the film reel on the reel spindle.
4. Plug in the film reel onto the carrier of the reel spindle.
5. Slide the locking device on the reel spindle until it locks in with an audible click.

Attention: When operating with **film reels,** the inner shaft of the locking device has to be **sunk,** otherwise press the locking button and slide the inner shaft backwards.

3.6.5. THREAD FILM CORRECTLY

FILM	THREAD DIRECTION
S8 mm film (option S8 scanning req.)	Put perforation to the film deck plate
16mm film	Put perforation to the film deck plate
35mm film	Put audio track to the film deck plate

3.6.5.1. Film roll with bobbin operation

Slide the full film roll, as shown below, onto the left winding plate and lead the film on film path "A" (printed on the film deck plate) to the right winding plate.
Insert the film leader into the slot of the winding body and give the winding plate a few turns counterclockwise.

3.6.5.2. Film reel operation

Slide the full film reel onto the left reel spindle and lead the film on film path "A" to the right (empty) film reel.
Insert the film leader into the slot of the film reel and give the reel a few turns counterclockwise.

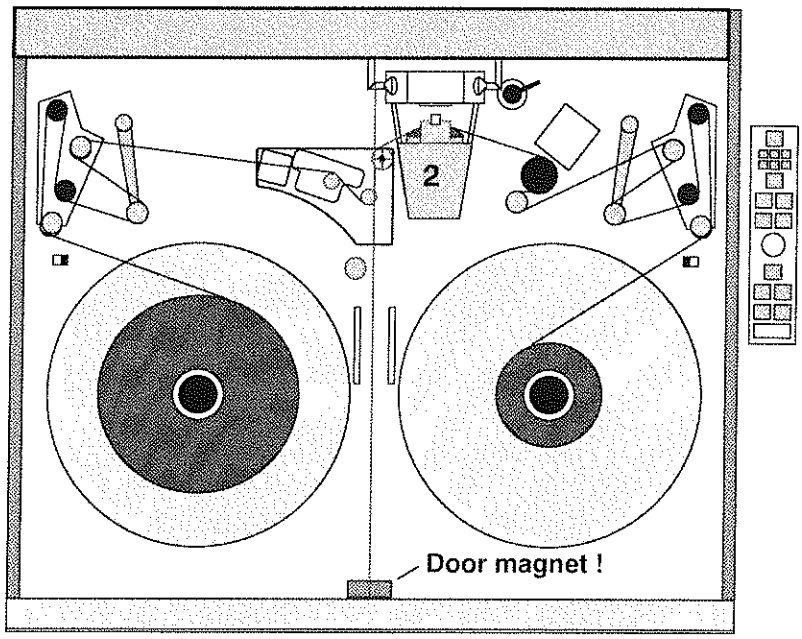


Fig. 333: Film threading path

Note! When threading the film into the film guiding edges of the optical block make sure that the film properly fits to the edges and that there are no emulsion deposits at the film guiding edges (for cleaning see section 6.2.1.).

Attention! When threading films with a magnetic sound track never touch the door magnet of the front doors (danger of erasing)!

3.6.5.3. **Switch to standby**

Subsequently press key STANDBY on the Local Control Panel of the film scanner (film is tightened).

3.7. ADJUST FRAME LINE

To achieve a correct vertical picture position for 35mm films press "Framing" key on the Local Control Panel several times. This effects a coarse correction of the frame bar downward (1 perforation hole downward per film picture).
Shift frame line until it disappears under the upper or lower picture border.

or via Grahpical Control Panel GCP:

Select the Home menu.

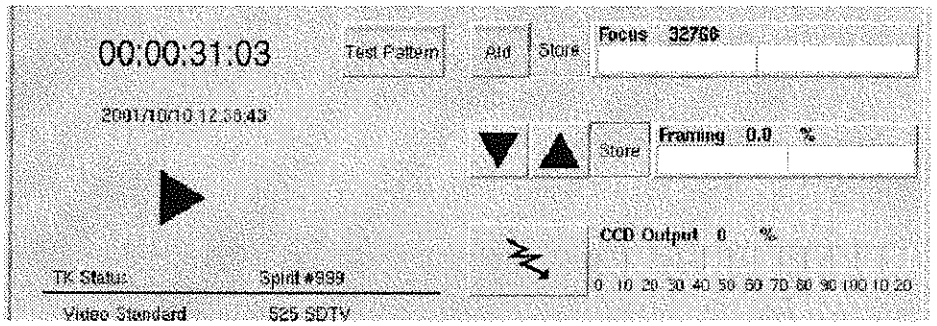


Fig. 334: Home menu with "Framing Adjust"

Shift the fame bar

Shift frame bar of 35mm film by pressing the framing coarse buttons (arrows up and down) several times until the frame bar disappears under the upper or lower picture border.

The framing fine sliders allow neat vertical positioning for all film formats.

Store frame bar position

Pressing the STORE button enables the current setting to be stored and recalled if you hit Unity.

Note!

For operation, first correct the frame bar and then make film/time code assignment, because shifting the frame bar by 1 frame will also shift the frame/time code assignment.
When placing the film on the sprocket wheel, take care to lace the frame bar on the cross line of the sprocket wheel. Thus, the frame bar will not be visible when playing the film.

Lace-up frame bar on the cross line

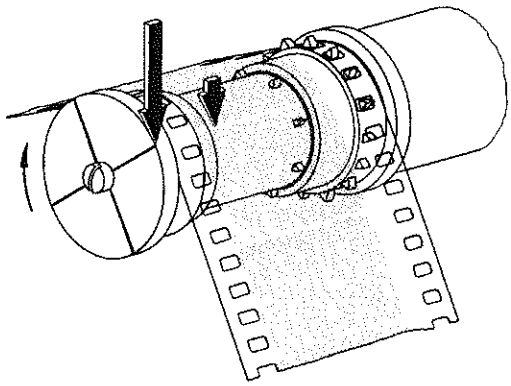


Fig. 335: Film position on the sprocket wheel

3.8. ADJUST FOCUS

Graphical Control Panel GCP1

The focus slider controls the focus servo in the film scanner.

Focussing can be done either with the digipot control or by sliding on the touchscreen.

Setting

Hitting the AID button sets zoom and contour to maximum and slows down the film speed to 6 fps.

Thus, film grain will appear as large and clear as possible which helps to find the optimum focus position.

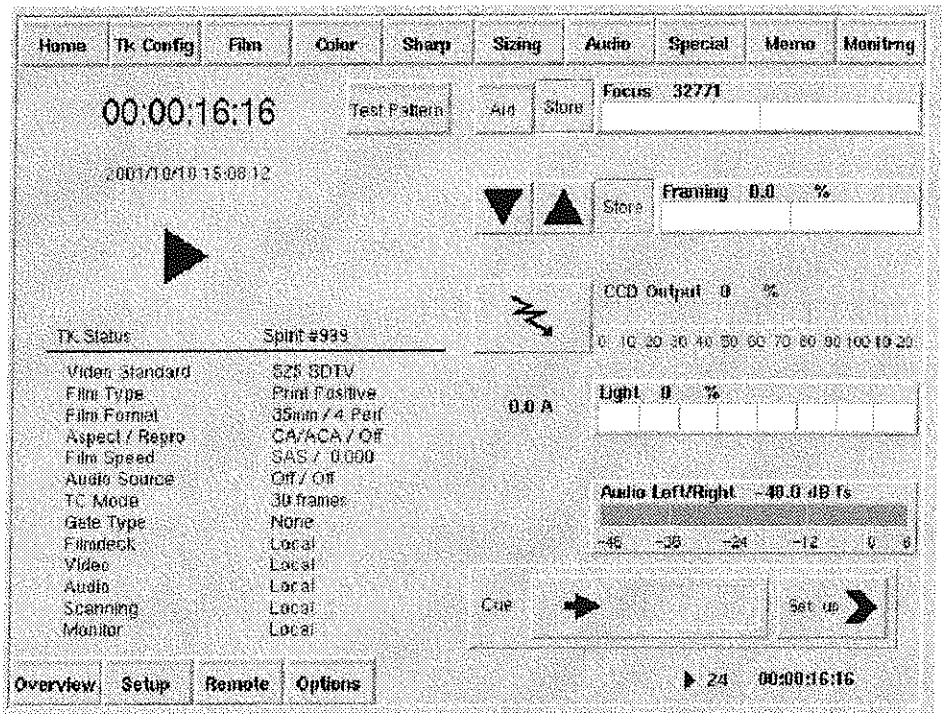


Fig. 336: Home menu with focus adjust slider

Storing

Hitting the STORE button and subsequently the O.K. button saves the focus value as the new default.

3.9. ADJUST SIZING FORMAT

The sizing format (scanning and reproduction format) of the film scanner is set in the **sizing menu.**

Preconditions

1. The TV standard is selected
   (i.e., line standard is determined, see section 3.3.2.).
2. According to film format (16mm, S16mm, 35mm, S35mm),
   the suitable optical block is used (see section 3.4.1.).
3. The film is threaded correctly (see section 3.6.).
4. The frame line is adjusted (see section 3.7.).

3.9.1. SELECT FIXED FILM SCANNING FORMAT (FIXED ASPECT)

On the film box of the film to be played, the **film scanning format (e.g. 1:1.85 / 1:2.20 / 1:2.35)** is noted in addition to the film format (16mm, 35mm etc.).
If this format corresponds to a fixed format of Fig. 338 (1.85 / 2.20 / 2.35), the following steps are necessary.

	Selection	*Where?*	*Function*
1	*Press button Sizing*	Control panel	The Sizing menu appears.

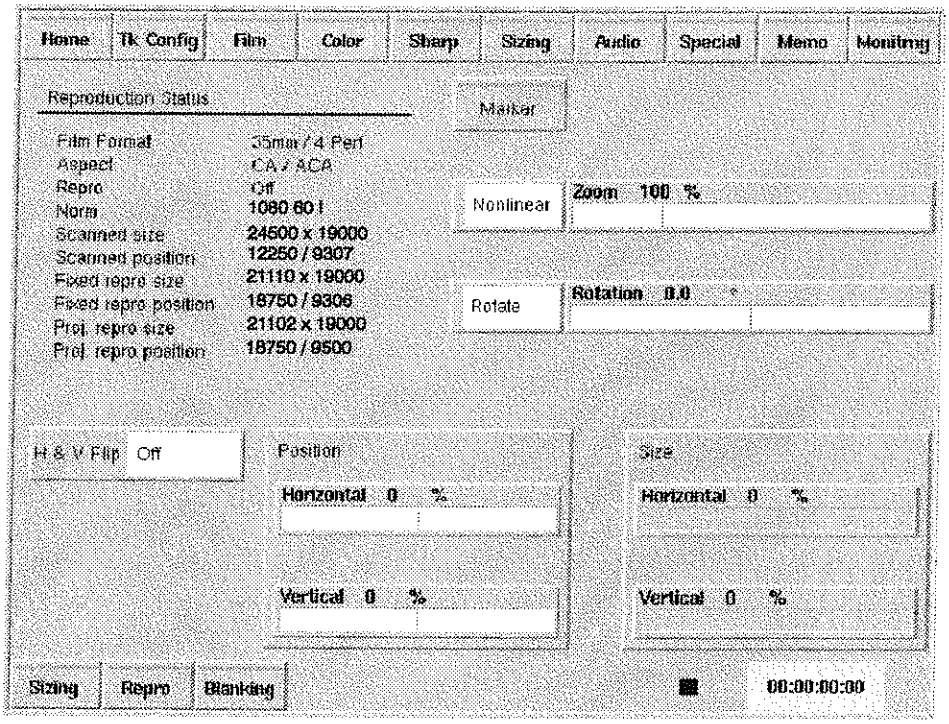


Fig. 337: Sizing menu

2	*Select submenu "Repro"*	Touch screen	Select a fixed scan format by pressing "Fixed Aspect" and according to the specification of the film scanning format on the film box.

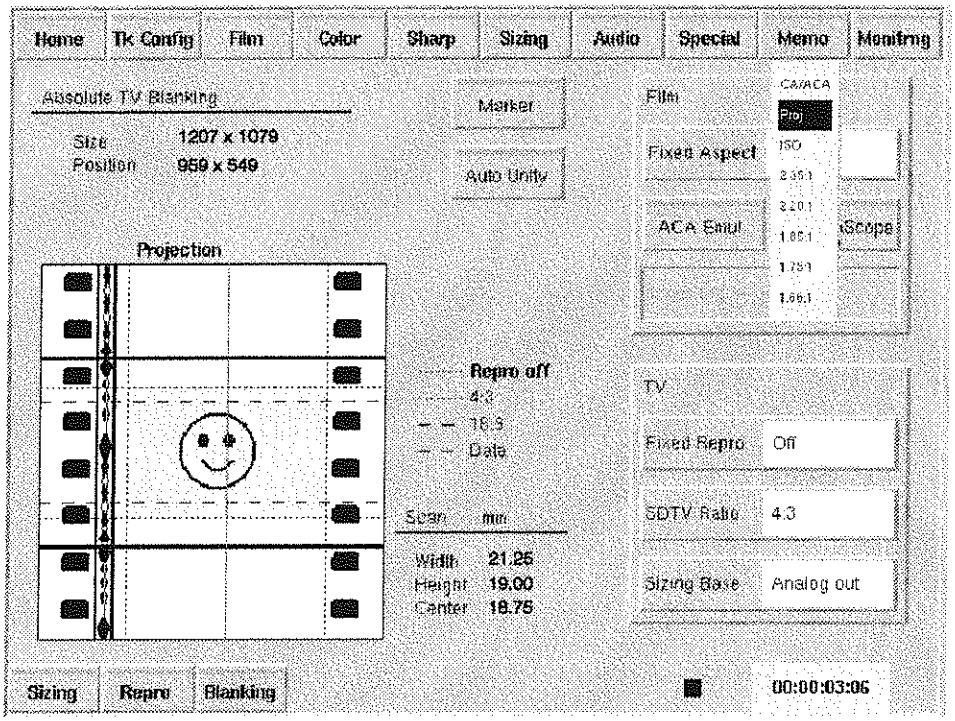


Fig. 338: Sizing menu, submenu Repro

3.9.2. SELECT FIXED REPRODUCTION FORMAT (FIXED REPRO)

When selecting a fixed film scanning format (see section 3.9.1.), a **suitable reproduction format** is selected each time automatically for this film.
If an other reproduction format should be wanted nevertheless, proceed as follows.

	Selection	Where?	Function
3	*Press the button Sizing*	Control panel	The Sizing menu appears.
4	*Select the submenu "Repro"*	Touch screen	Select button "fixed repro" The reproduction formats appears on the screen.

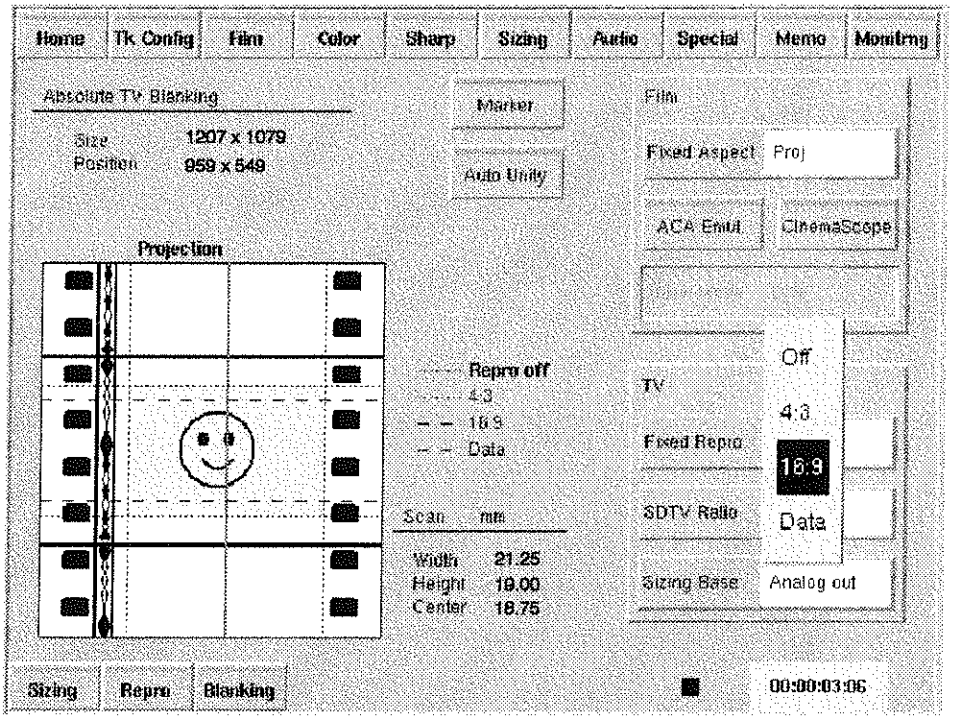


Fig. 339 Submenu Repro

5	*Make a new selection by pressing one of the repro formats*	pull down menu	Select further adjustments in the "Sizing menu" if necessary

3.9.3. ADJUST SIZING FORMAT VARIABLY

If the fixed reproduction format (as selected in section 3.9.2.) does not yet correspond to the requests, the reproduction format can also be adjusted variably.

	Selection	Where?	Function
6	*Press button Sizing*	Control panel	The Sizing menu appears.
7	*Select Size Window*	Touch screen	Sets sizing adjustments to default values.

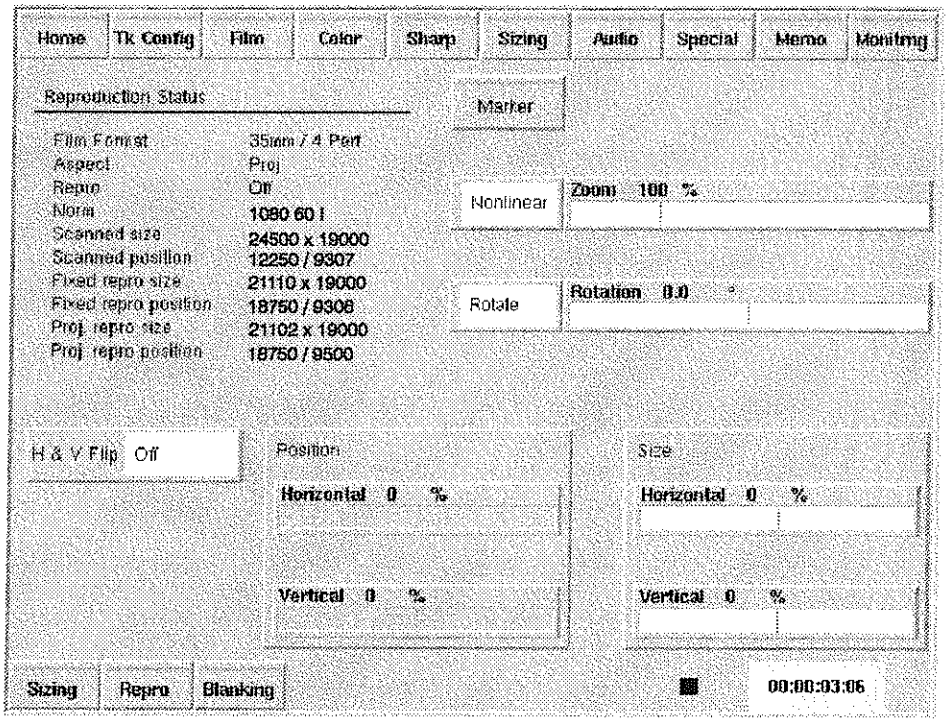


Fig. 340 Sizing menu

8	*Click on the area to activate the digipot control. When active, the sliders are highlighted*	Window	Adjust with the digipot or slide on the touchscreen the **vertical** and **horizontal** reproduction format Pay attention to the picture geometry, i.e. a circle has to be reproduced as a circle.

3.9.4. ADJUST HORIZONTAL AND VERTICAL BLANKING

	Selection	Where?	Function
9	*Press button Sizing*	Control panel	The Sizing menu appears.
10	*Select submenu Blanking*	Sizing menu	Submenu "Blanking" appears.

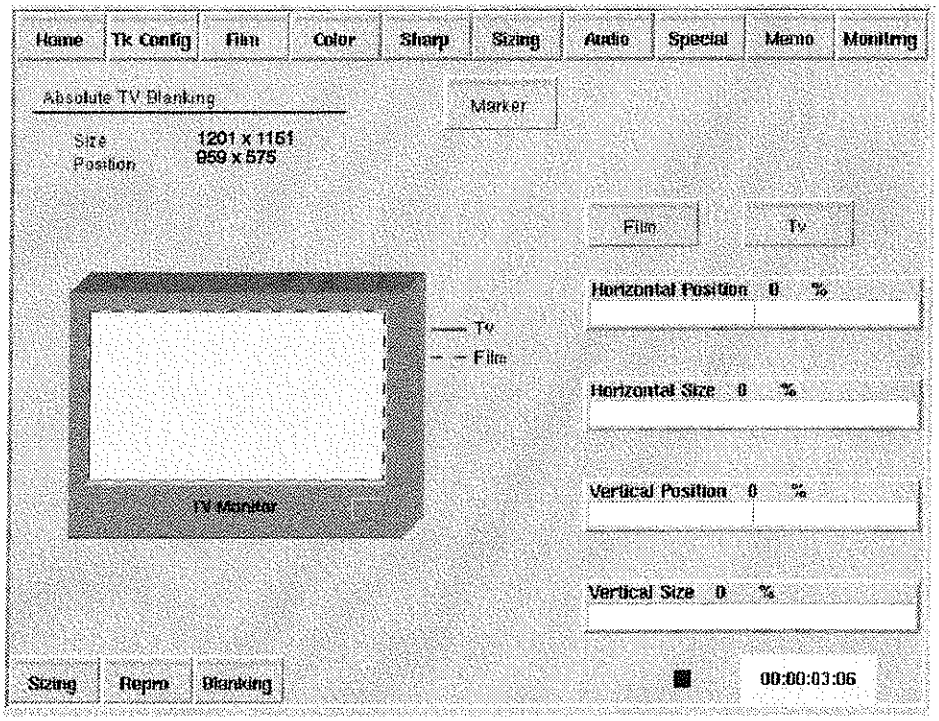
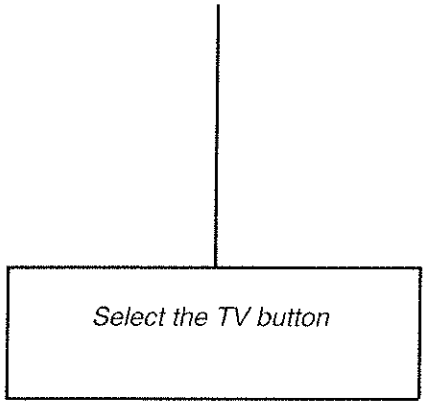


Fig. 341: Submenu "Blanking"

11	*Select the Film button*	Submenu Blanking	*The Film blanking adjustments (Size and Position) determine the section of the picture which is written into the frame store. Film blanking becomes part of the picture (with only black content)* Adjust with the digipot or sliders the **vertical blanking**, and the **horizontal blanking**.



Submenu
Blanking

The TV blanking adjustments (Size and Position) determine the section of the picture which is read out of the frame store. TV blanking is not part of the picture. It behaves like an external blanking rendered by a production switcher.

Adjust with the digipot or sliders
the **vertical blanking**,
and
the **horizontal blanking**.

The blanking settings should limit film picture content only slightly.

Vertical frame line corrections have to be made before as described in section 3.7.

3.10. MATCHING TO DIFFERENT COLOR AND MONOCHROME FILM TYPES

Precondition for this section are the preceding sections of chapter 3.

The most important ones are:

1. Film scanner user-specifically configurated
2. FPN correction performed
3. Film threaded
4. Frame line optimized
5. Picture optically focused
6. Sizing format adjusted

3.10.1. DEFINE FILM TYPE

	Select	*Where?*	*Adjust function*
1	*Press button Film*	Control panel	The Film menu appears

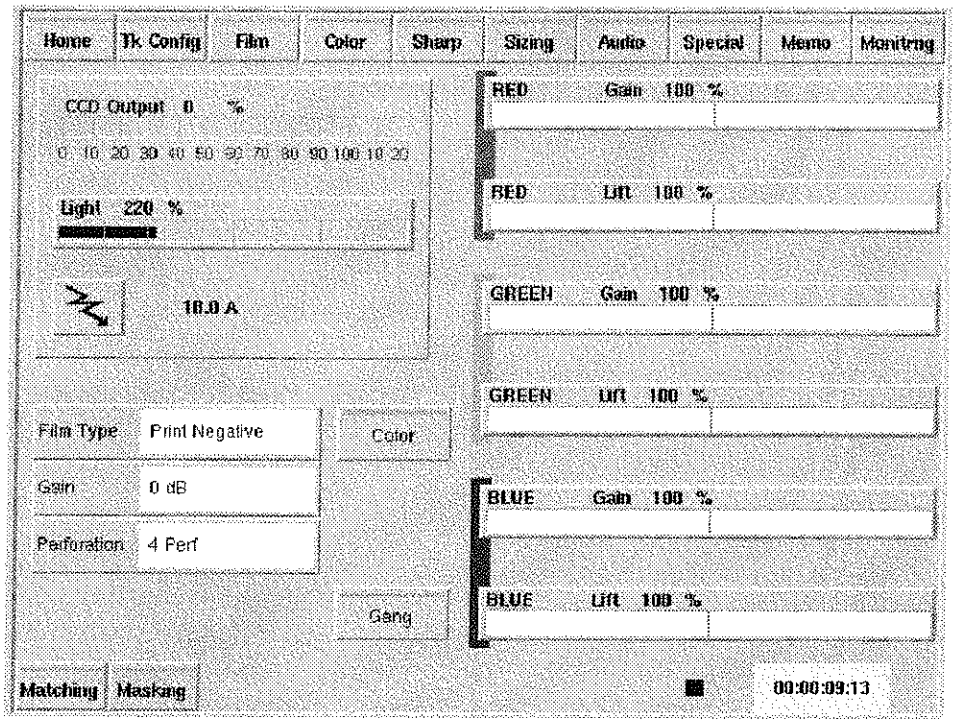


Fig. 342: Film menu

2	*Double click function button "unity ALL"*	left to the touch-screen	Adjusts standard values for the complete film menu.
3	*Select button Film Type*	Film menu	Make your choice from the drop-down menu. For each filter type, positive and negative setting are available. This function also switches the gamma according to the selected film type.

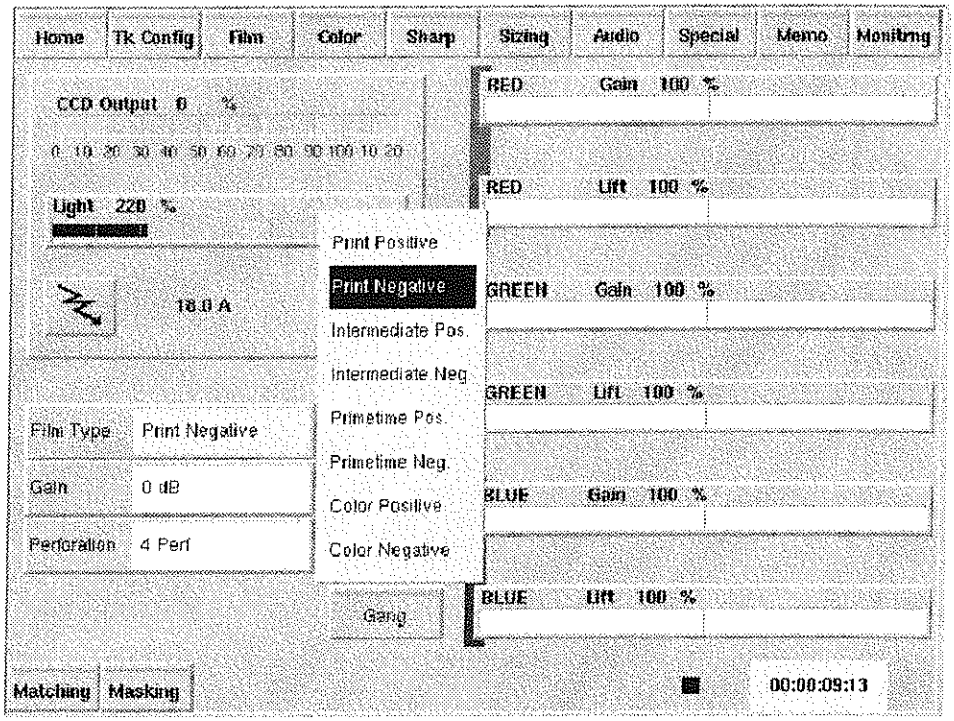


Fig. 343: Film menu with drop down menu "Film Type"

4	*Depending on film to be played, select one of the film types*	Pop-down menu	Defines the following **film types**: **Print Positive** **Print Negative** **Intermediate Pos.** **Intermediate Neg.** **Primetime Pos.** **Primetime Neg.** **Color Positive** **Color Negative**

3.10.2. ADJUST FILM MASKING

	Select	Where?	Adjust function
5	*For matching to special films, select submenu "Masking",*	Film Menu	Opens submenu "Film masking"

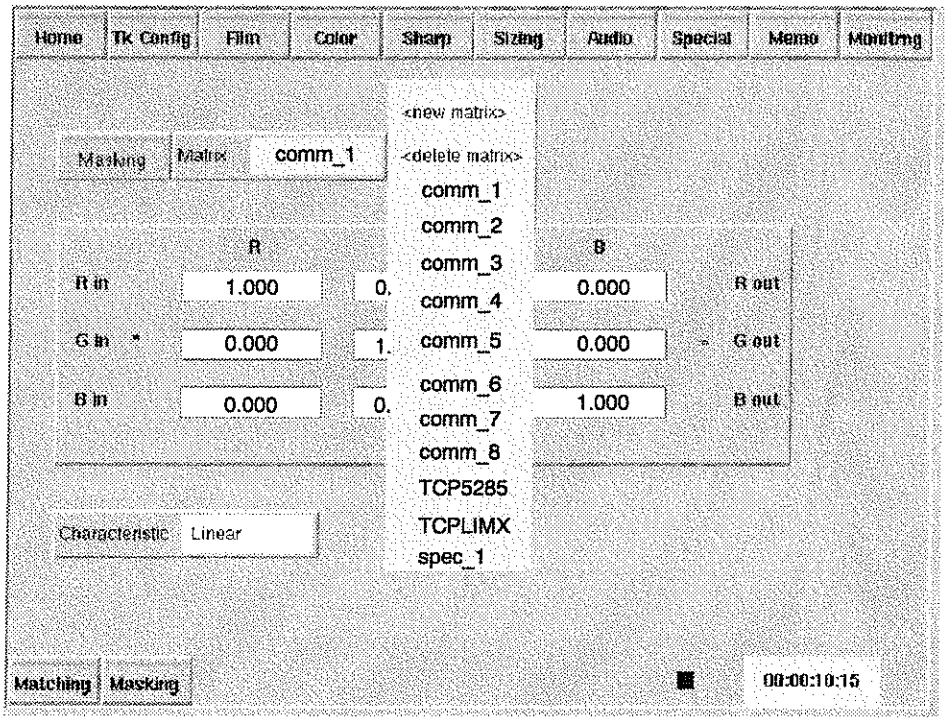


Fig. 344: Submenu "Film masking with pull-down menu matrix

6	*Click button Matrix. Select fixed, preadjusted matrix coefficients from the drop-down menu.*	Judge the color reproduction in the output picture and via WFM output testpoint 4 Mask/CRT Gamma

For test purposes use testpoint 4 Mask / CRT Gamma

Menu Monitoring

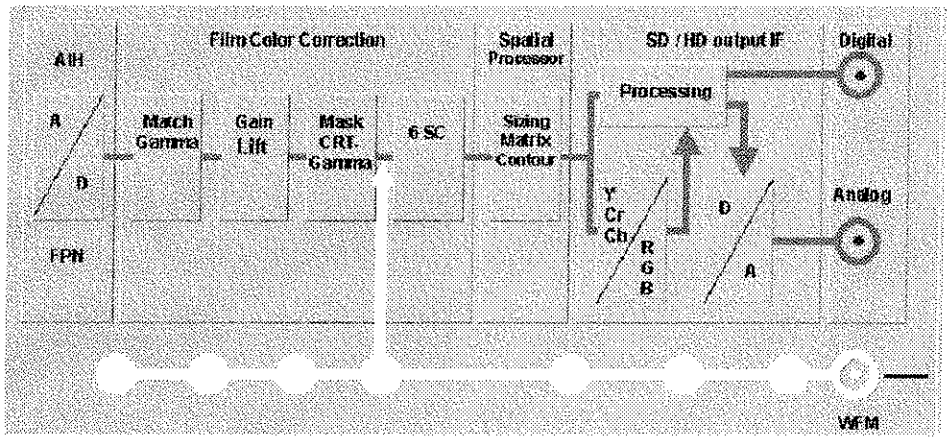


Fig. 345:Menu Monitoring, submenu Test Points

7	*If the correct color reproduction in the output pictures not yet achieved, click on new matrix in the drop-down menu*		An additional window "Enter new Matrix" opens and a two lined keypad is activated in the top of the menu.

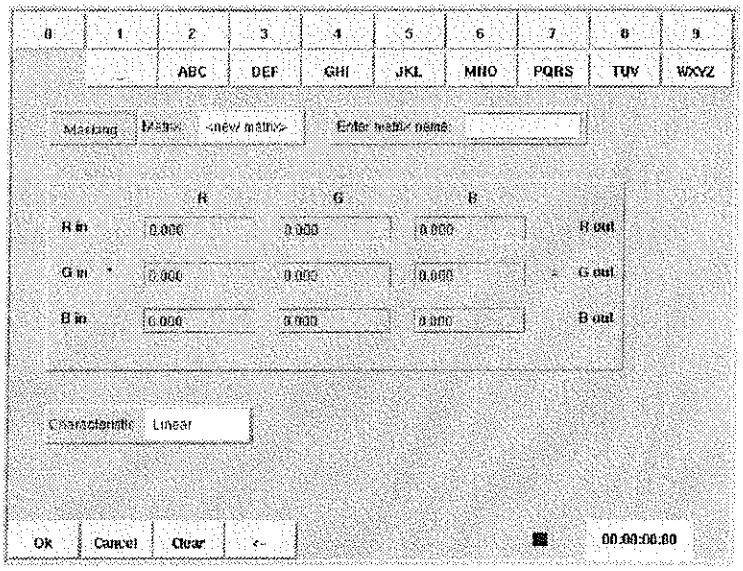


Fig. 346: Set new matrix name

8	*Type in the name for the new matrix coefficient*	Submenu Masking	Confirm by pressing the OK button. Now the coefficients in the matrix window can be modified.
9	*Clicking on the coefficients opens a numeric keypad on the top of the menu.*	Submenu Masking	Type in your modified values and confirm by pressing OK.

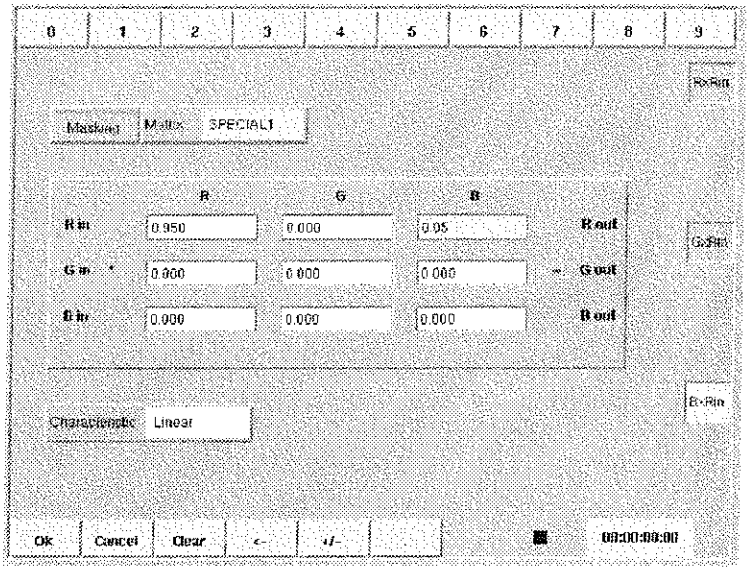


Fig. 347: Set coefficients

3.10.3. ADJUST INTENSITY OF FILM ILLUMINATION

	Select	Where?	Adjust function
10	*Press menu button Film*	Control panel	The Film menu appears

Slide CCD Output for 100 % video level

Flash button

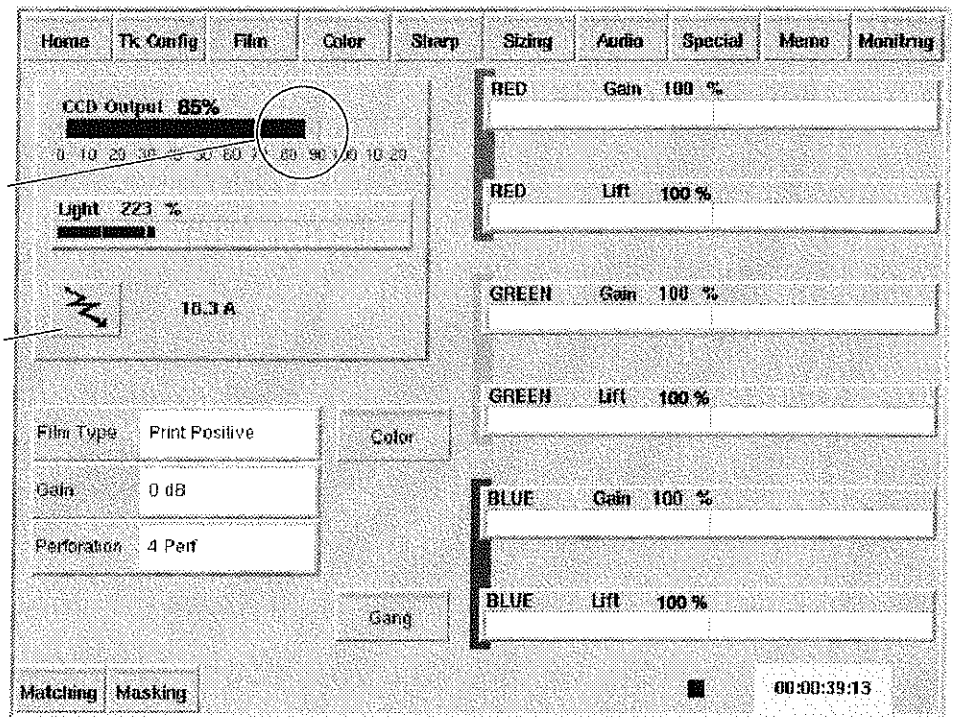


Fig. 348: Film menu

For test purposes use testpoint 1 AIH / A/D Menu Monitoring

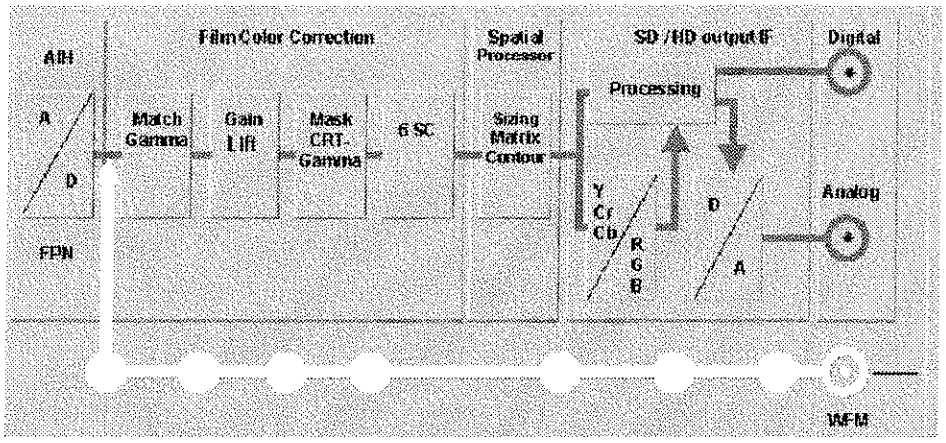
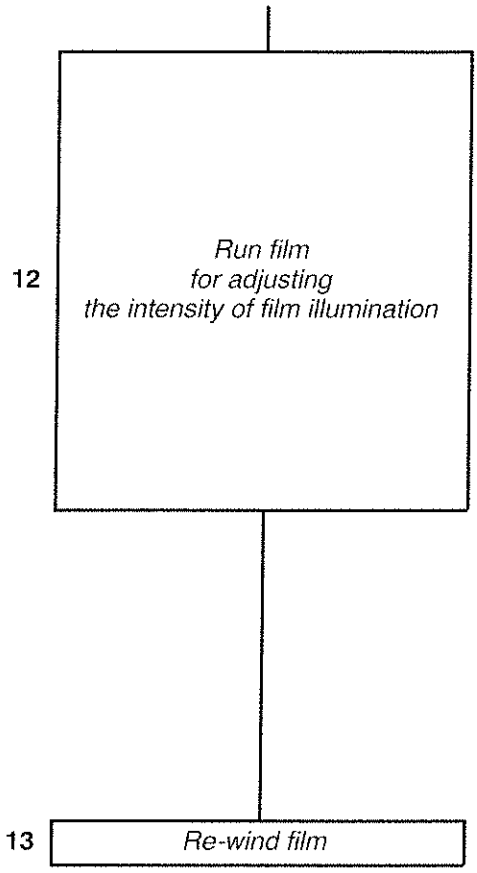


Fig. 349:Menu Monitoring, submenu Test Pnt

11	*Shift slider "Light"* or use the trackball	Film Menu	The amount of light falling via the film on the CCDs can be controlled.



Search for a scene with low film density (bright lights, clouds or similar) and adjust the intensity of film illumination in such a way that the brightest one of the RGB video signals reaches a level of 100 % (oscilloscope).

"CCD Output Level Display:
During adjustment watch the CCD Output Level Display!
Make sure that this level is around 85%.

Or during Play:
Pressing the "Flash button" sets film illumination intensity at once to maximum CCD output level.

If 100 % video level is not reached, switch video basic gain to + 6 dB (see section 3.10.4.) and adjust the film illumination intensity again.

Attention!
Exceeding 22A lamp current may shorten the life span of the projection Xenon lamp.

3.10.4. ADJUST ANALOG SIGNAL BASIC GAIN

	Select	Where?	Adjust function
14	*Press button Gain*	Film Menu	Opens pull down menu and shows the possible selections for **analog basic gain**.

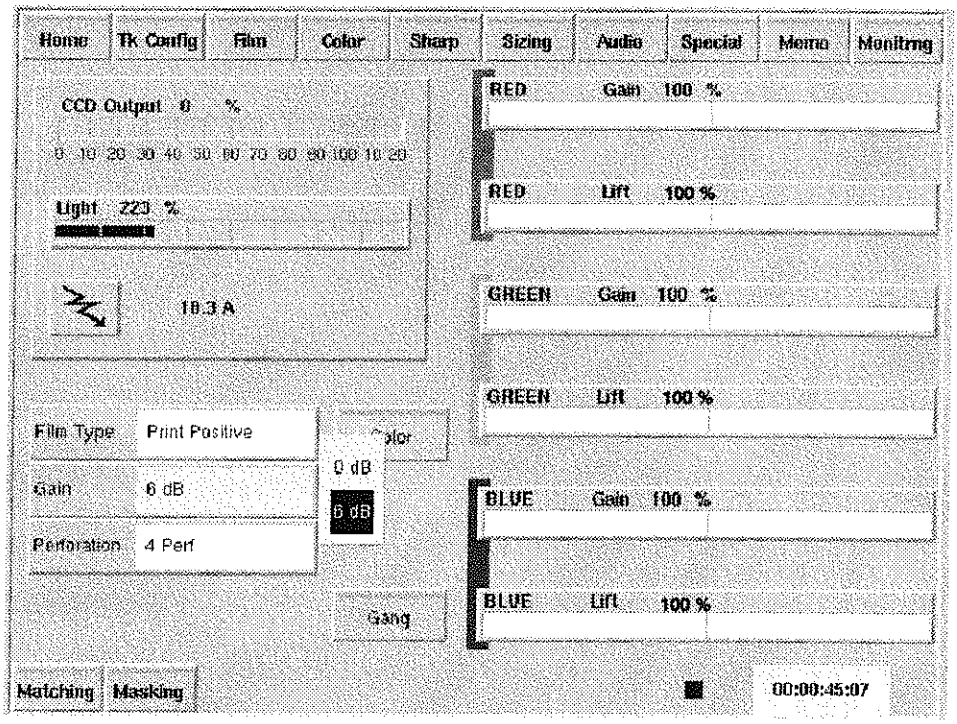


Fig. 350: Film menu with pull down menu Gain

15	*Run film for judging the film density*		With very dense film material, use basic gain "6 dB".
16	*Select 6dB*	Pulldown menu	Selection "6 dB" doubles now the analog gain.

For test purposes use testpoint 1 AIH / A/D Menu Monitoring

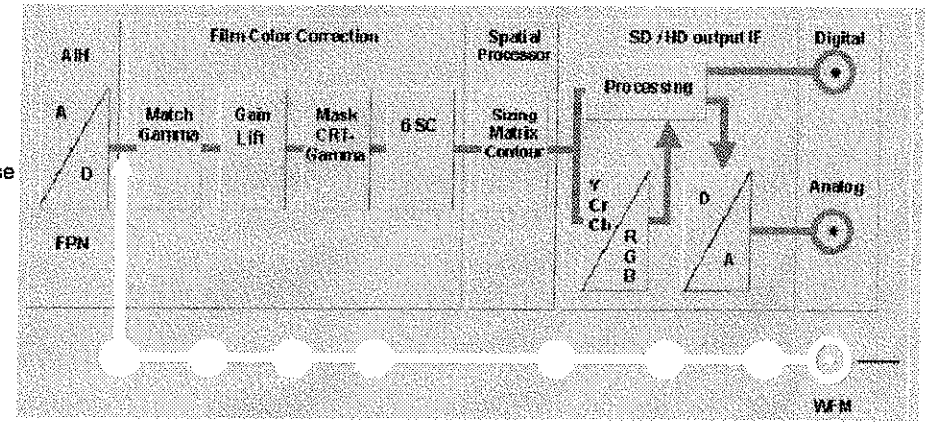


Fig. 351:Menu Monitoring, submenu Test Pnt

3.10.5. ADJUST LIFT & GAIN (BLACK & WHITE SIGNAL LEVEL RANGE)

	Select	*Where?*	*Adjust function*
17	*Press menu button Film*	Control panel	The Film menu appears

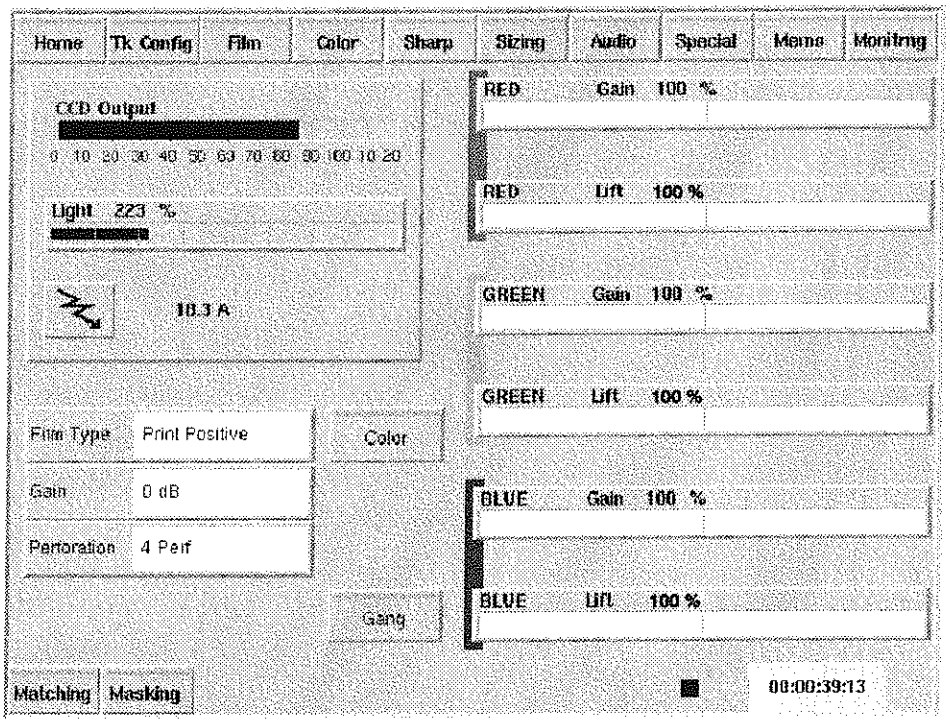


Fig. 352: Film menu

For test purposes use testpoint 3 Gain / Lift Menu Monitoring

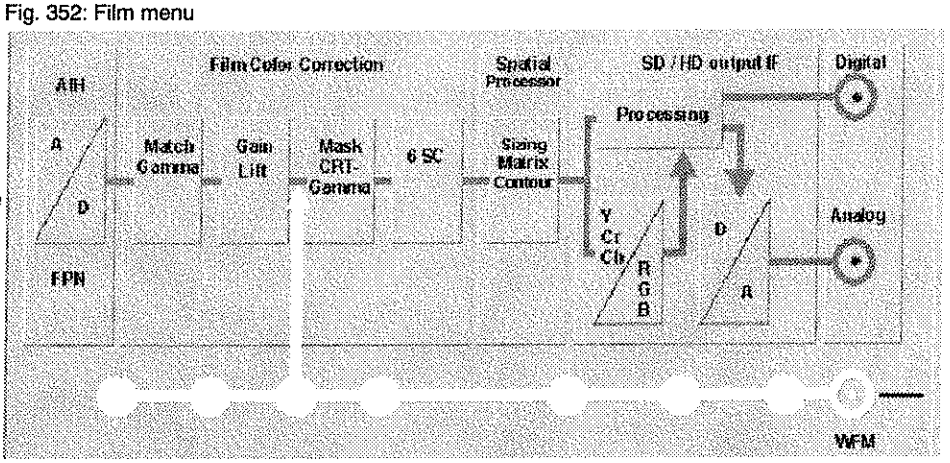
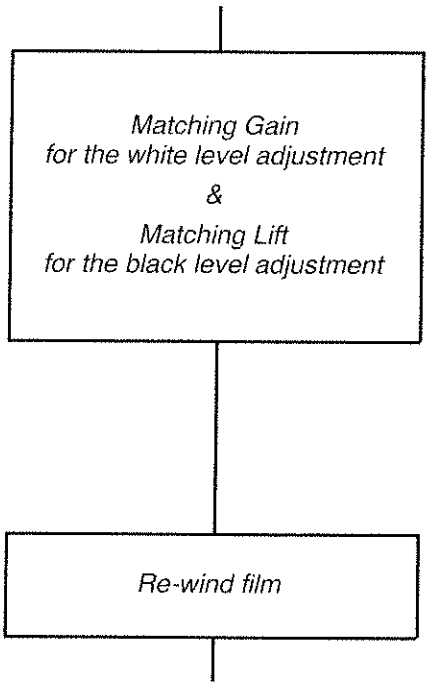


Fig. 353:Menu Monitoring, submenu Test Pnt

18	*Run film scanner for adjusting the white level (and then the black level)*	Search for a scene with picture white (or picture black) and stop.



Film menu

Adjust picture white
in the R, G and B channels
with the corresponding digipot controls or by
sliding on the touch screen matching **Gain**
in all channels to 100 % video signal.

Adjust picture black
in the R, G and B channels
in matching **lift** RGB
to 1 % setup)

This is the **basic adjustment** for the film to be played.

Color corrections during later operation (scene for scene) are made via the **Color menu**.

3.10.6. ADJUST BLACK LEVEL (BLACK MASTER & BLACK RGB*)

	Select	*Where?*	*Adjust function*
21	*Press menu button "Color"*	Contr. panel	The Color menu with submenu Primary color correction appears

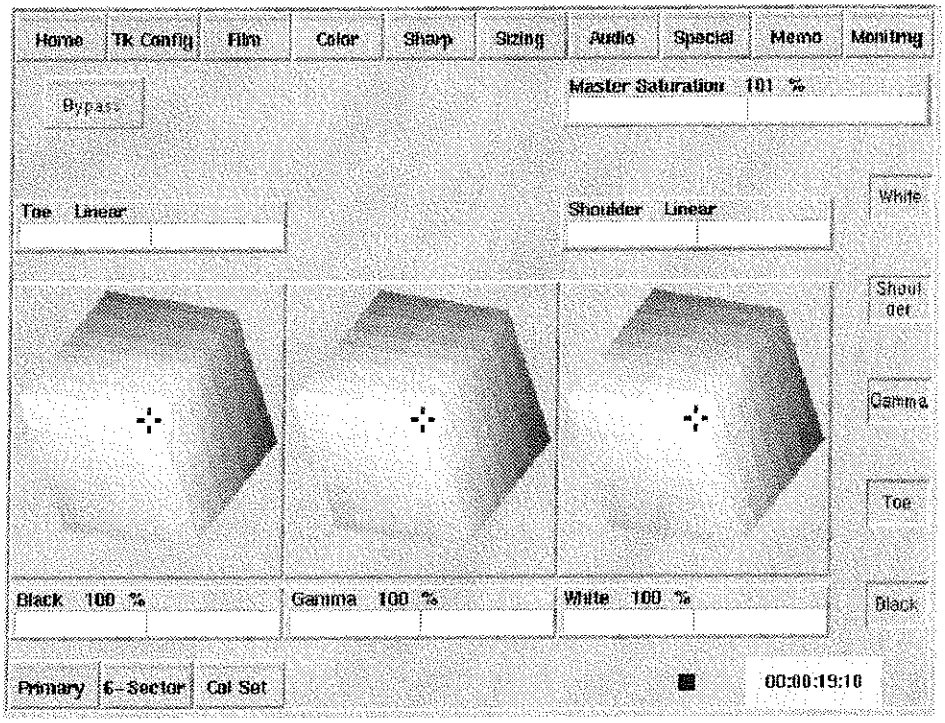


Fig. 354: Color menu

For test purposes use testpoint 4 Mask / CRT Gamma

Menu Monitoring

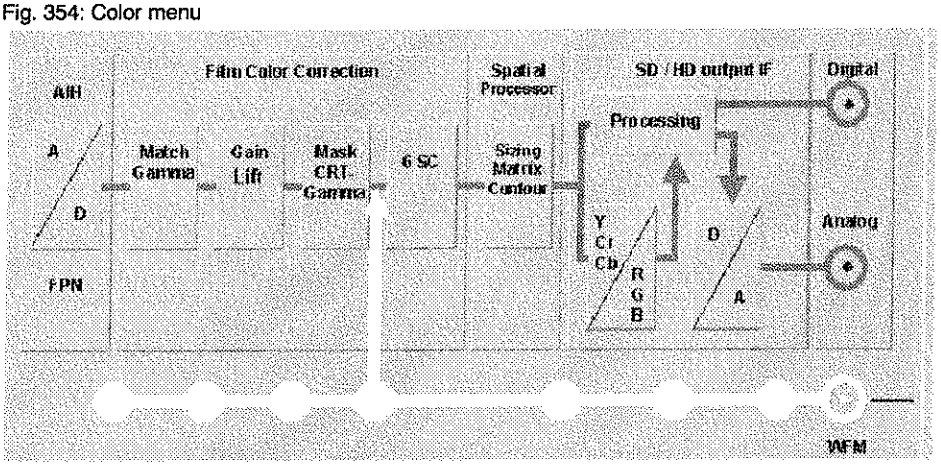
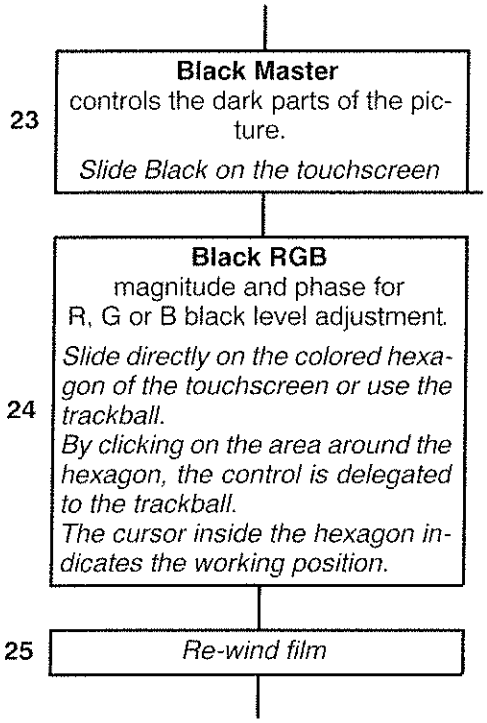


Fig. 355:Menu Monitoring, submenu Test Pnt

22	*Run film for adjusting the **black levels***	Search for a film scene with a **black object** and stop.

* Adjustments of Black Master and Black RGB do not change White level.



23 **Black Master**
controls the dark parts of the picture.
Slide Black on the touchscreen

Color menu

Adjust the relevant channels to **1 %** black signal level

24 **Black RGB**
magnitude and phase for R, G or B black level adjustment.
Slide directly on the colored hexagon of the touchscreen or use the trackball.
By clicking on the area around the hexagon, the control is delegated to the trackball.
The cursor inside the hexagon indicates the working position.

Color menu

Adjust the relevant channels to **1 %** black signal level

*The adjustments are judged on the color monitor and changed until an **optimum black level reproduction** is achieved.*

25 *Re-wind film*

3.10.7. ADJUST WHITE LEVEL (WHITE MASTER & WHITE RGB*)

	Select	Where?	Adjust function
26	*Color menu*	Contr. panel	

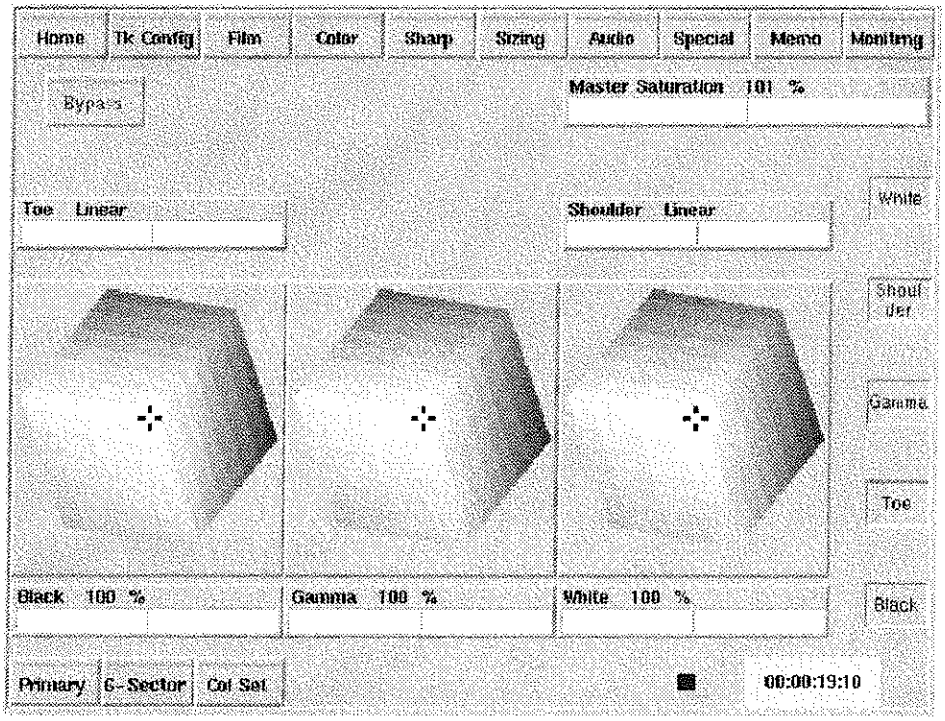


Fig. 356: Color menu

27	*Run film for adjusting the **white levels***		Search for a film scene with a **white object** and stop.
28	**White (Master)** slide White on the touch screen	Touch screen	Adjust the relevant channels to **100 %** white level
	White (RGB) magnitude and phase for R, G or B white level adjustment *Slide directly on the colored hexagon of the touchscreen or use the trackball.* *By clicking on the area around the hexagon, the control is delegated to the trackball.* *The cursor inside the hexagon indicates the working position.*		Adjust the relevant channels to **100 %** white level The actual adjustment is displayed with cursor in the RGB hexagon The adjustments are judged on the color monitor and changed until an **optimum white level reproduction** is achieved.

* Adjustments of White Master and White RGB do not change Black level.

3.10.8. ADJUST GRAY LEVEL (GAMMA MASTER & GAMMA RGB)

	Select	*Where?*	*Adjust function*
29	*Color menu*	Control panel	

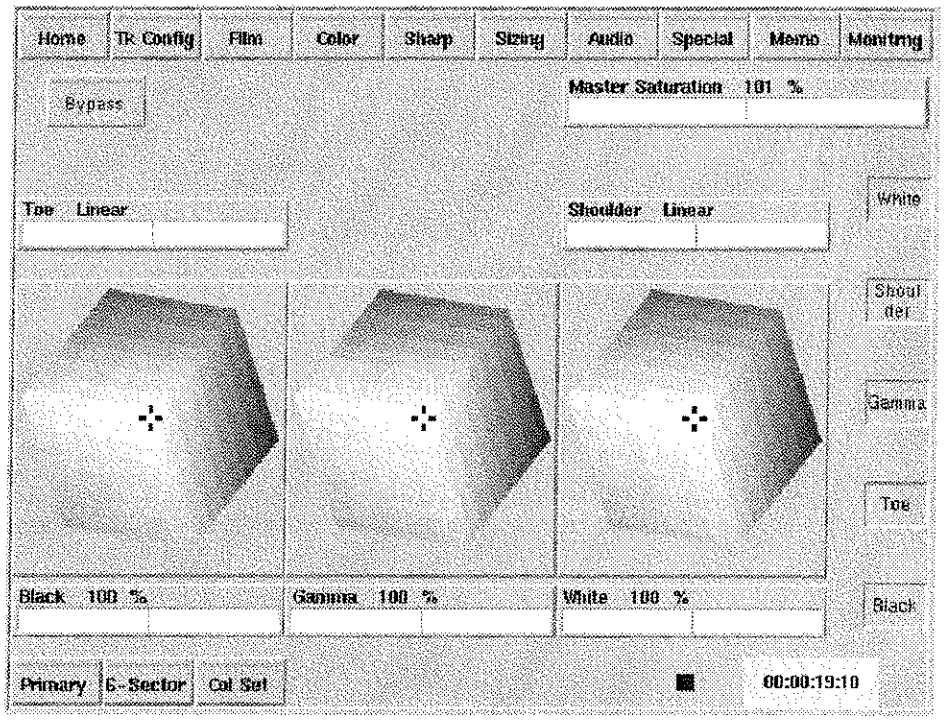


Fig. 357: Color menu

30	*Run film for adjusting the medium gray levels*		Search for a film scene with a **medium gradation** and stop.
31	***Select Gamma*** *slide Gamma on the screen*	Menu	The relevant channels become adjustable for the gray levels
32	**Gamma RGB** magnitude and phase for R, G or B gray level adjustment *Slide directly on the colored hexagon of the touchscreen or use the trackball. By clicking on the area around the hexagon, the control is delegated to the trackball. The cursor inside the hexagon indicates the working position.*		The actual adjustment is displayed with cursor in the Gamma hexagon The adjustments are judged on the color monitor and changed until an **optimum gray level reproduction** is achieved.
33	*Rewind film*		

3.10.9. ADJUST CONTOUR AND CORING

	Select	Where?	Adjust function
34	select Sharp menu	Control panel	

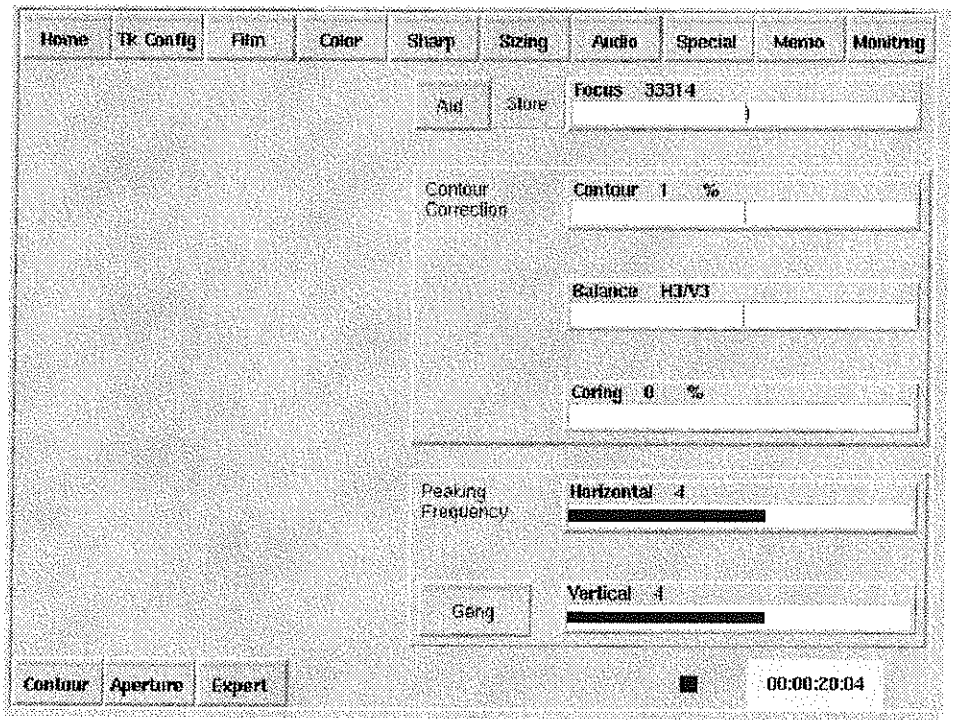


Fig. 358: Sharp menu

For test purposes use testpoint 5
Sizing / Matrix / Contour

Menu Monitoring

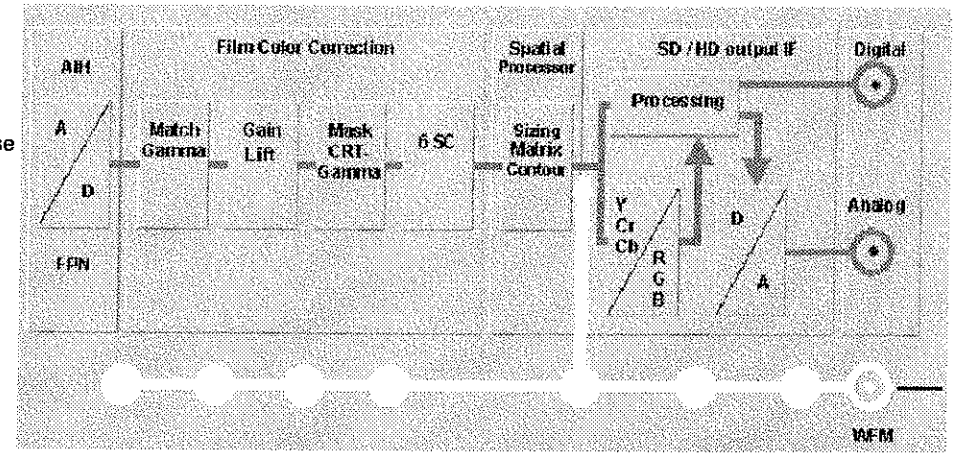
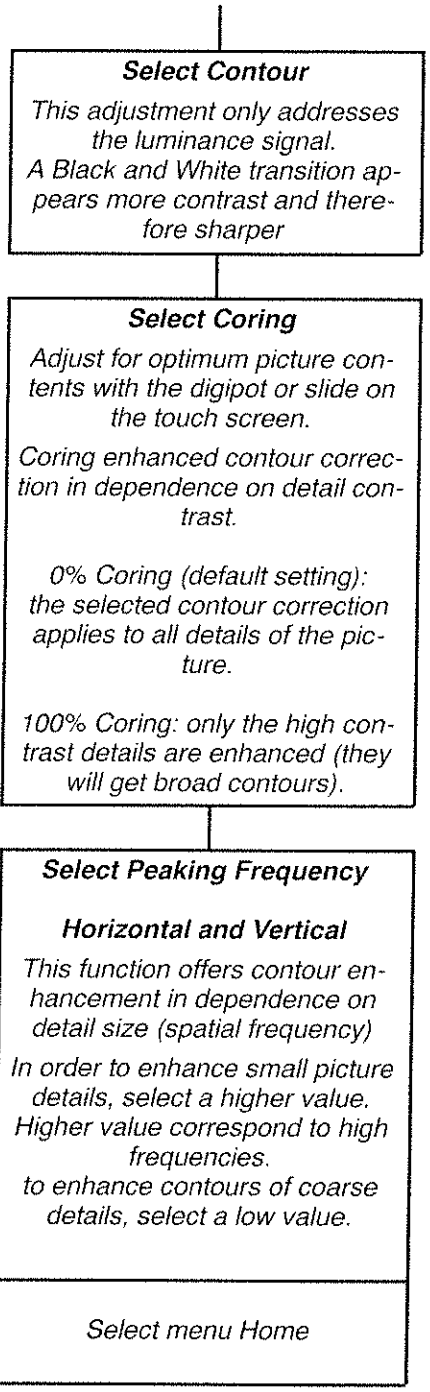


Fig. 359:Menu Monitoring, submenu Test Pnt

35	*For adjustment search the appropriate film picture and operate the film scanner in the still frame mode.*	**Contour adjustment:** picture with fine and coarse details **Coring adjustment:** picture with noise in the black areas



36	***Select Contour*** *This adjustment only addresses the luminance signal.* *A Black and White transition appears more contrast and therefore sharper*	Sharp menu	Set **Contour** correction for optimum H and V contour with coring set to 0%. For that adjust CONTOUR Balance to H3/V3. PEAK FREQUENCY H/V to coarse (e.g."1") or fine details (e.g. "7").
37	***Select Coring*** *Adjust for optimum picture contents with the digipot or slide on the touch screen.* *Coring enhanced contour correction in dependence on detail contrast.* *0% Coring (default setting): the selected contour correction applies to all details of the picture.* *100% Coring: only the high contrast details are enhanced (they will get broad contours).*	Sharp menu	Increase coring from 0% until the optimal grain suppression in the black areas is reached. Repeat contour adjustment, if necessary.
38	***Select Peaking Frequency*** ***Horizontal and Vertical*** *This function offers contour enhancement in dependence on detail size (spatial frequency)* *In order to enhance small picture details, select a higher value. Higher value correspond to high frequencies.* *to enhance contours of coarse details, select a low value.*	Sharp menu	Increase Peak Frequency H&V to enhance small picture details. Repeat contour adjustment, if necessary.
39	*Select menu Home*	Control panel	Closes Sharp menu, stores new Contour adjustments and returns to the Home menu.

3.11. ADJUST AUDIO CHANNELS (OPTION)

Before leveling the audio channels, first adapt them to the studio environment.
For adaption, select the Audio Config menu.
This menu determines with its submenus the sequence for proceding (from left to right, see below).

3.11.1. SELECT AUDIO SOURCES

Requirements

1. Depending on the film format (16mm, S16mm*, 35mm, S35mm*), the optical block suitable to the film to be played is used (see section 3.4.1.).
2. The film is threaded correctly and ready for play (see section 3.6.).

* S16 and S35 films have no own audio track.
External audio sources, such as SEPMAG via INPUT EXTERN 1, 2 are usually selected as audio sources.

	Select	*Where?*	*Adjust function*
1	*Touch button* ***Audio*** *& select submenu* ***A Config***	Contr. panel	The Audio Configuration menu appears

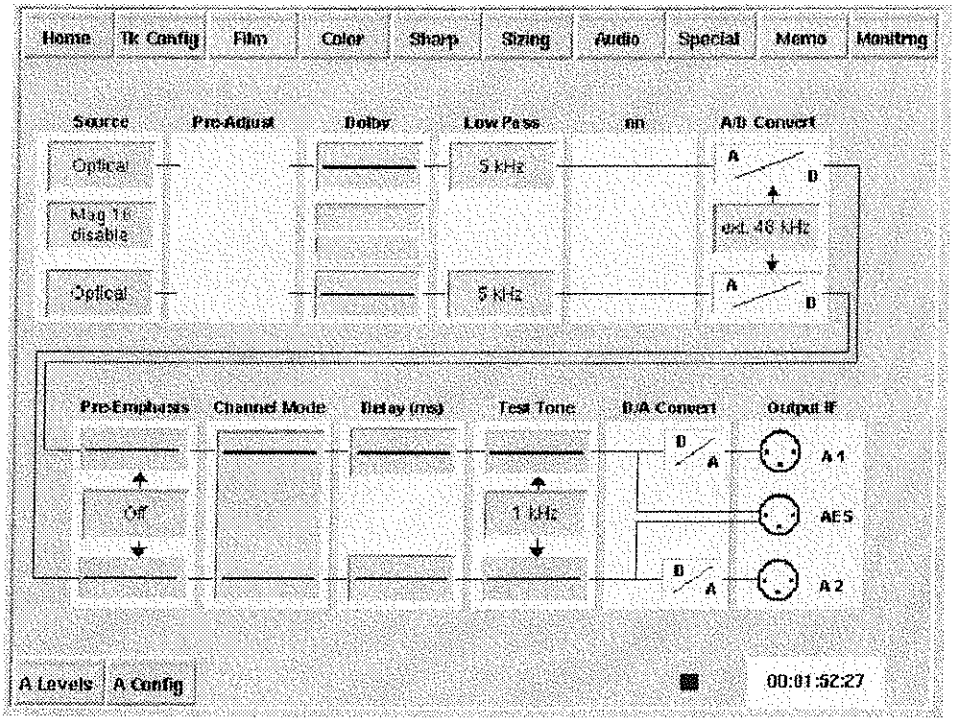


Fig. 360: Audio Config menu

2	*Touch **Source** section*	Audio Config Menu	Window "Input Source" is opened

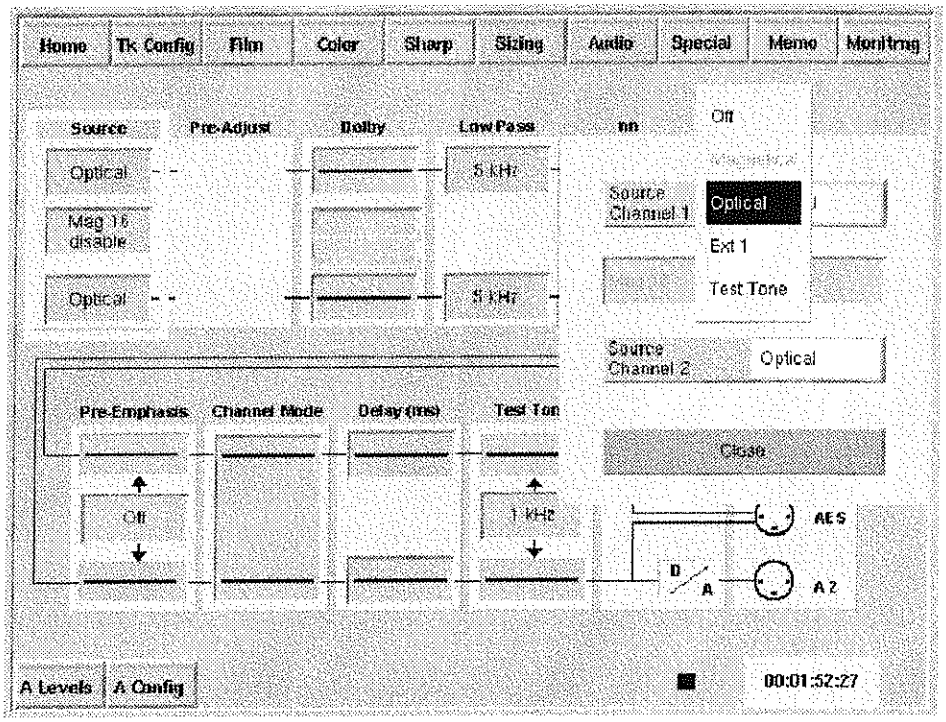


Fig. 361: Audio Config menu with pull-down menu "Input Source"

3	*Touch button **Source Channel 1***	Pull down menu	Depending on the film used, select audio source for audio channel CH 1. **Magnetical** for Sepmag Units **Optical** for light sound **Ext 1/2** External sources **Test Tone** 1 or 10 KHz
4	*Touch button **Source Channel 2***	Pull down menu	Select audio source for channel CH 2
5	*To exit the window, click on the **Close** button*	Pull down menu	Close window

3.11.2. PRE-EQUALIZE AUDIO SOURCES

Note: Function "Pre-Adjust" is only operable for the service by means of a service code.

	Select	*Where?*	*Adjust function*
6	*Select* ***Preadjust*** *section*	Audio Config menu	The window "Pre-Adjust" appears. *This window contains basic factory settings for pre-amplifier levels & pre-equalizing*

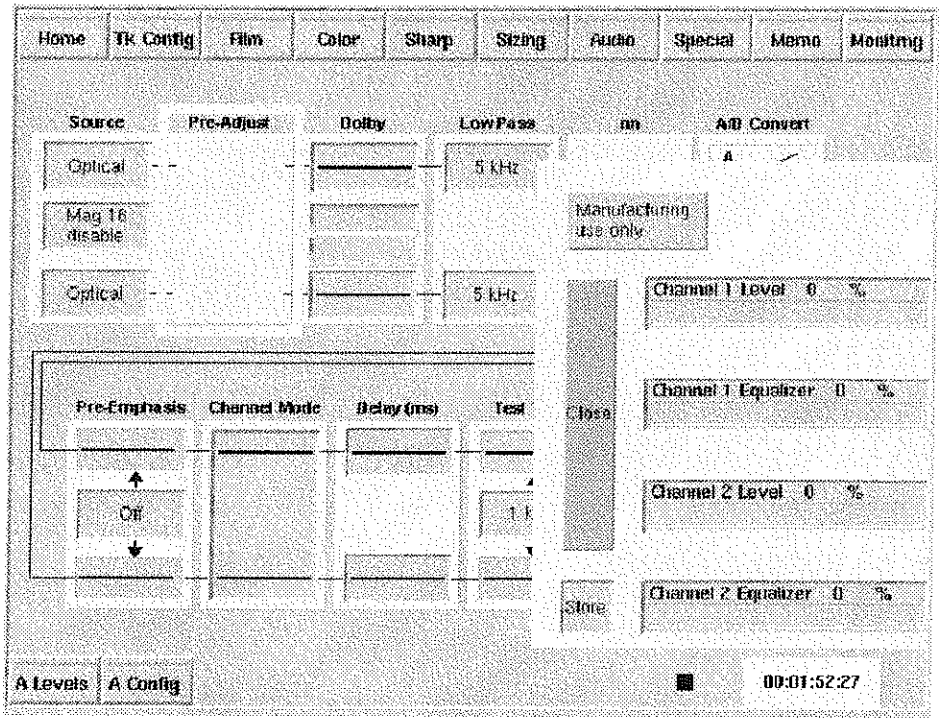


Fig. 362: Audio Config menu with window "Pre-Adjust"

Both audio channels are exactly factory-preadjusted. Therefore, input level and pre-equalization need no further correction.

Adjustments have to be performed by service personnel only (special test films required).

For further details see chapter 6.7 "Change Comopt Sound Lamp" in this manual.

3.11.3. ADJUST DOLBY NOISE REDUCTION

	Select	*Where?*	*Adjust function*
7	*Touch **Dolby** section*	Audio Config menu	The window "Noise Reduction" appears.

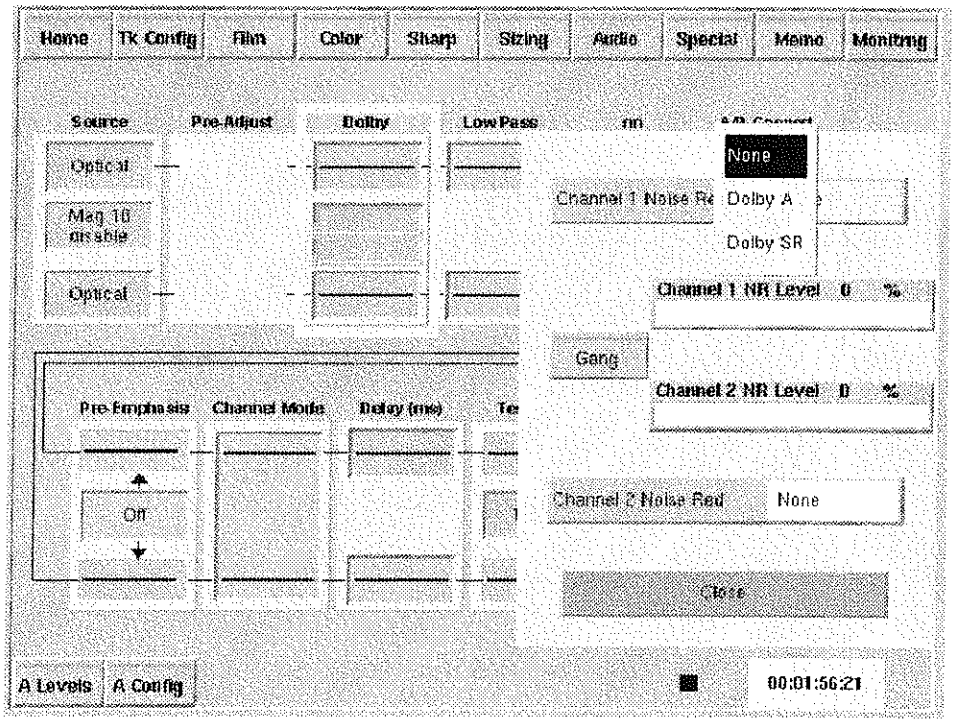


Fig. 363: Audio Config menu with window "Setup Noise Reduction"

8	*Press **Channel 1/2 Noise Red***	Window	Depending on the film used, (with dolbysated audio), select the **noise reduction mode**.

Dolby A: **not selectable**

Dolby SR: Noise reduction via external dolby SR add-on unit (SR: Spectral Recording)

OFF: Film without dolby audio

	Select	Where?	Adjust function
9	*Press* ***Channel 1/2 NR level***	Window	**Adjust dolby level:** (only for external dolby SR device) 1. Switch on dolby test tone on external device and read deflection on its indicating instrument. 2. Play film with dolby test tone on the film scanner and also read the deflection on the external indicating instrument. 3. Change adjustment at the film scanner until test tone level and film scanner level show the same reading. Adjustment of the dolby level is made by pressing "Gang" and turning digipot dial.
10	*Press button* ***Close***	Window	Close window

3.11.4. SELECT LOWPASS FILTER

	Select	Where?	Adjust function
11	*Touch **Low Pass** section*	Audio Config menu	The window "Low Pass" appears

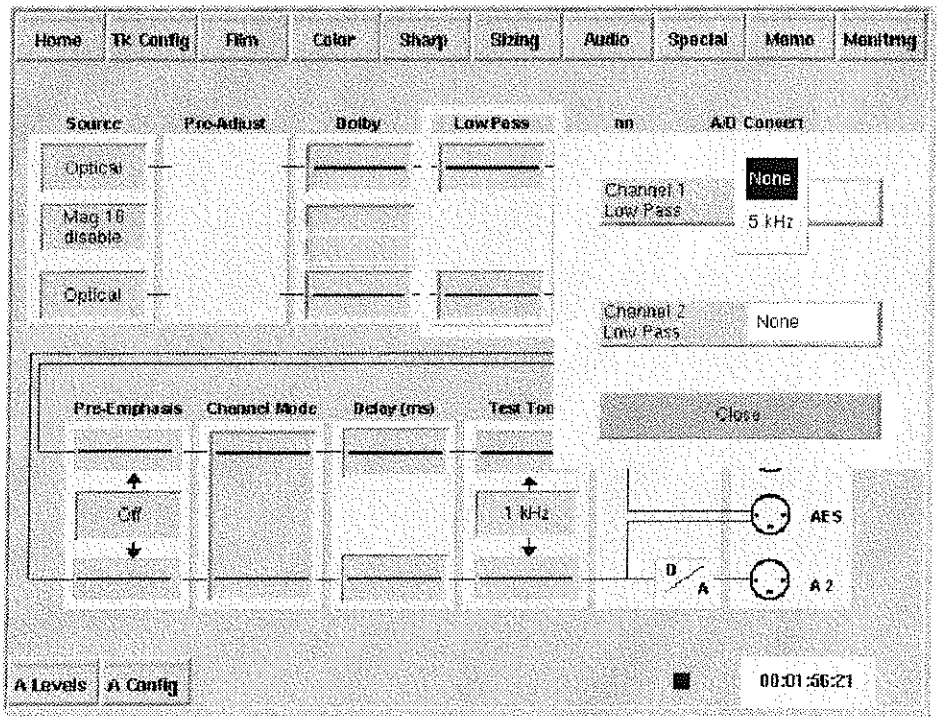


Fig. 364: Audio Config menu with window "Low Pass Filter"

12	Run film (for judging the film sound)		
13	*Press button **Channel 1/2 Low Pass***	Pull down menu	Depending on the film sound quality, switch on or off the lowpass filter. **None:** Film audio channel is **not** filtered **5 kHz:** Film audio channel is filtered
14	*Re-wind film*		
15	*Press button **Close***	Window	Close window

3.11.5. SYNCHRONIZE DIGITAL AUDIO CHANNELS

	Select	Where?	Adjust function
16	*Touch **A/D Convert** section*	Audio Config menu	Window "A/D Converter Reference" appears

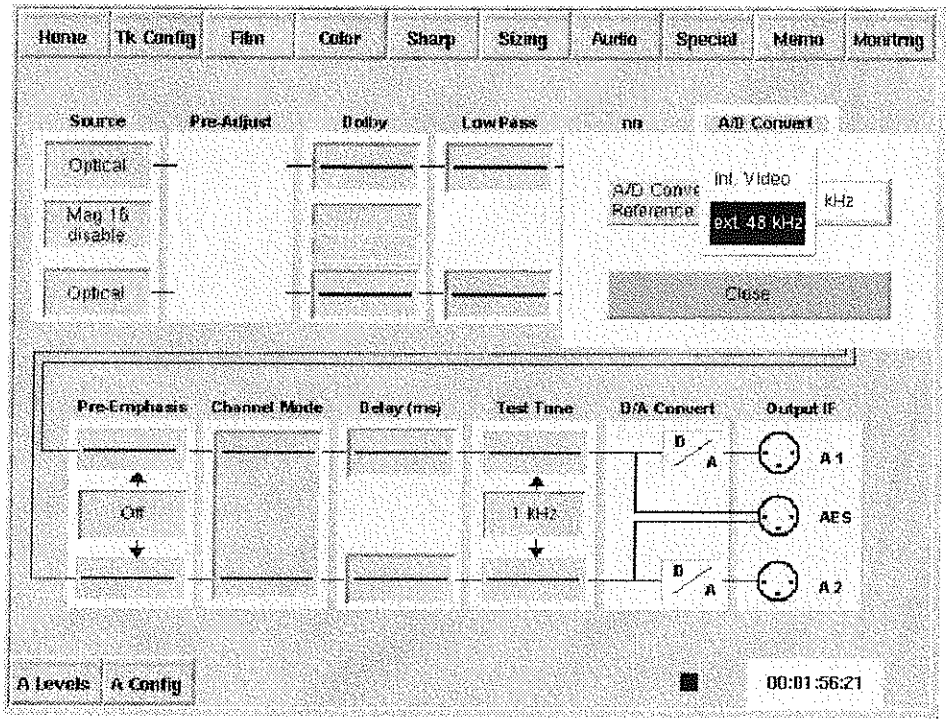


Fig. 365: Audio Config menu with window "A/D Convert"

17	*Touch A/D Convert Ref & Select **int. Video** or **ext. 48KHz***	Window	Depending on the succeeding audio studio, lock the digital film sound of the film scanner either with its own video signal (standard) or use an external 48kHz synchronization when it is also used for synchronization of the external audio studio.
18	*Press button **Close***	Window	Close window

int Video: Digital audio channels are video-locked

ext 48 kHz: Digital audio channels are synchronized on 48 kHz

3.11.6. SELECT PREEMPHASIS

	Select	Where?	Adjust function
19	*Touch **Pre-Emphasis** section*	Audio Config menu	The window "Pre-emphasis" appears

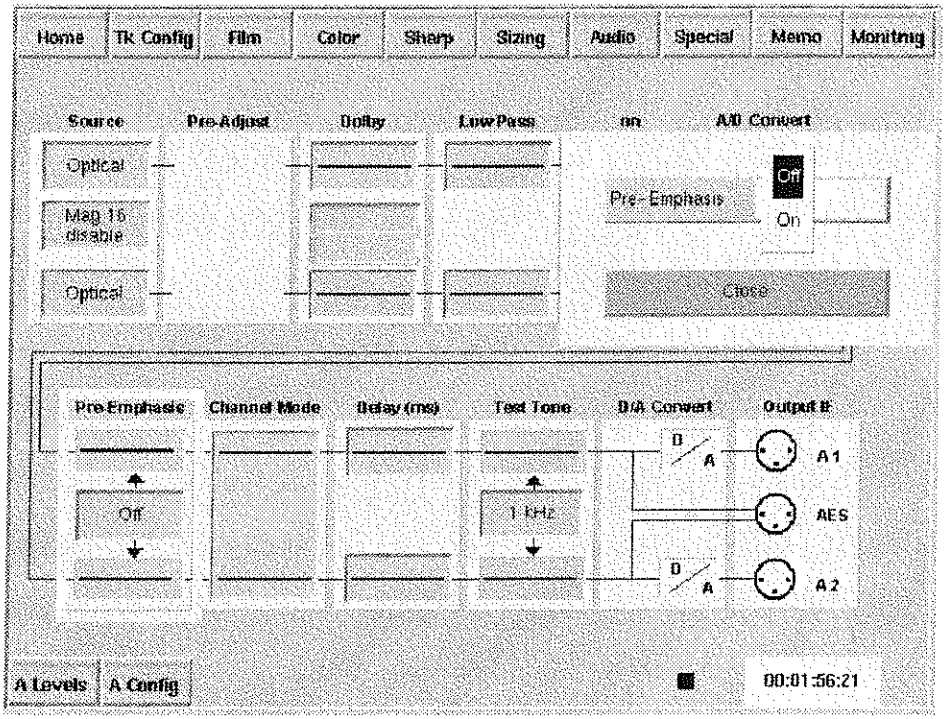


Fig. 366: Audio Config menu with window "Setup Preemphasis"

20	*Press button **Pre-Emphasis** & select **On** or **Off***	Window	For improving the signal-to-noise ratio prior to A/D conversion or for adaption to other contributions in the digital audio studio, the digital audio channels of the film scanner can be provided with a preemphasis. Pre-emph: peaking of frequency components prior to A/D conversion; reduction after D/A conversion **OFF:** Preemphasis off (standard) **ON:** Preemphasis on (CD-type preemphasis, EQ time constant: 50/15 µs)
21	*Press Close*	Window	Close window

3.11.7. SELECT MONO/STEREO OPERATION

	Select	*Where?*	*Adjust function*
22	*Select* ***Channel Mode*** *section*	Audio Config menu	Window "Channel Mode" appears

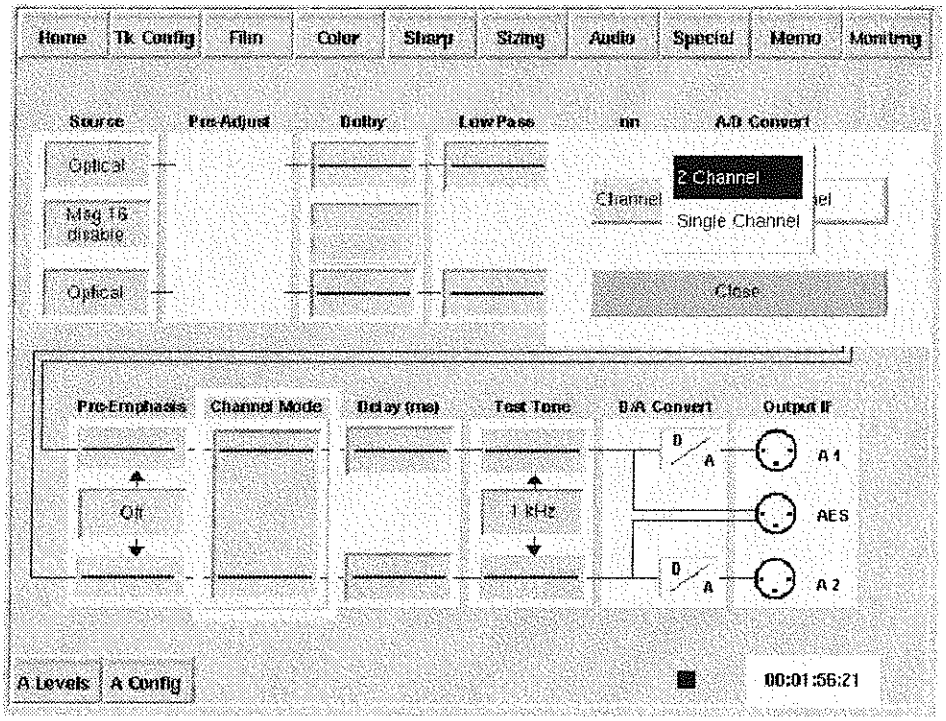


Fig. 367: Audio Config menu with window "Select Output Mode"

23	Press button **Channel Mode** & select **2 Channel** or **Single Channel**	Pull down menu	Depending on the film used (mono or stereo film), **select the audio channel mode**.

Single Channel (Mono)

Analog output 1 = audio 1
Analog output 2 = audio 1

Subfr. A in the digital AES output. = audio 1
Subfr. B in the digital AES output. = audio 1

2 CHANNEL (Stereo):

Analog output 1 = audio 1
Analog output 2 = audio 2

Subfr. A in the digital AES output = audio 1
Subfr. B in the digital AES output = audio 2

	Select	Where?	Adjust function
			MONO (for stereo film): Analog output 1 = audio 1 + 2 mixed* Analog output 2 = audio 1 + 2 mixed* Subfr. A+B mixed/dig. AES output = Audio 1* Subfr. A+B mixed/dig. AES output = Audio 2*
			* In order to avoid overmodulation, the output levels of the mixed audio signals are reduced by 4.5 dB.
24	*Press button* ***Close***	Window	Close window

3.11.8. ADJUST LIP-SYNCHRONOUS FILM SOUND

	Select	Where?	Adjust function
25	*Press **Delay** section*	Audio Config menu	The window "Channel Delay" appears

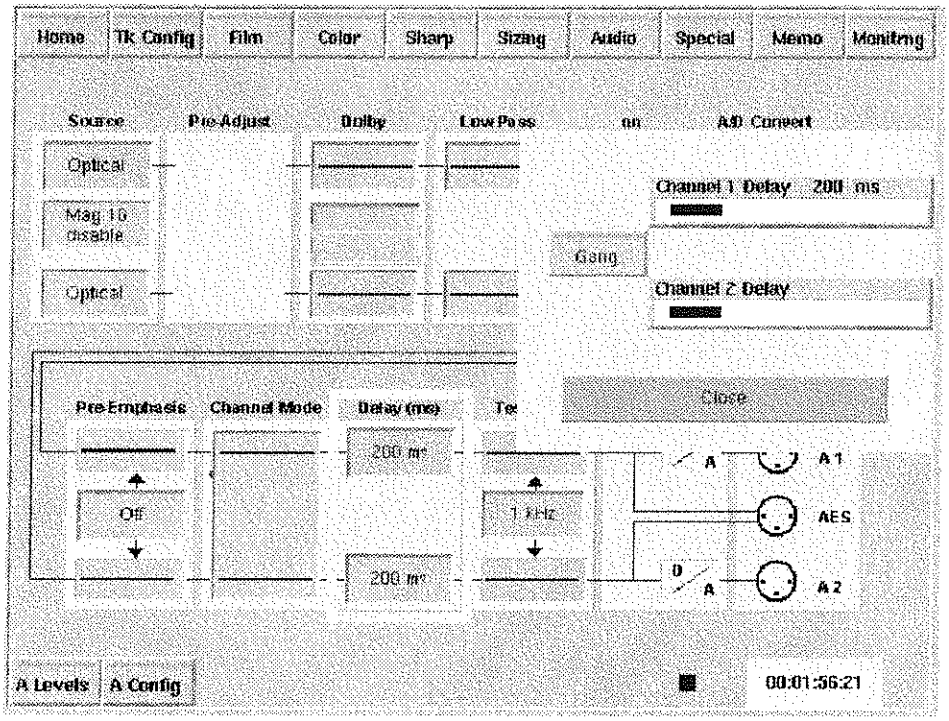


Fig. 368: Audio Config menu with window "Setup Channel Delay"

26	*Run film for judging lip synchronism. Compare picture and sound at the studio output.*		When playing a film, picture and sound are always lip-synchronous at the output of the film scanner. The adjustable audio channel delay only compensates film frame delays caused for example by a succeeding video studio.
27	*Adjust the delays by sliding on the touchscreen or use the digi-pot control*	Window	Depending on the delay between picture and sound, delay the film sound (for stereo in both channels). The adjustable delay depends on the film format and is approx. within 0 and 1.2 s (in steps of 10 ms).
28	*Re-wind film*		
29	*Press button **Close***	Window	Close window

3.11.9. CHECK FILM AUDIO PATHS WITH TEST TONE

	Select	Where?	Adjust function
30	*Press **Test Tone** section*	Audio Config menu	Window "Test Tone" appears and the finally selected test tone is indicated.

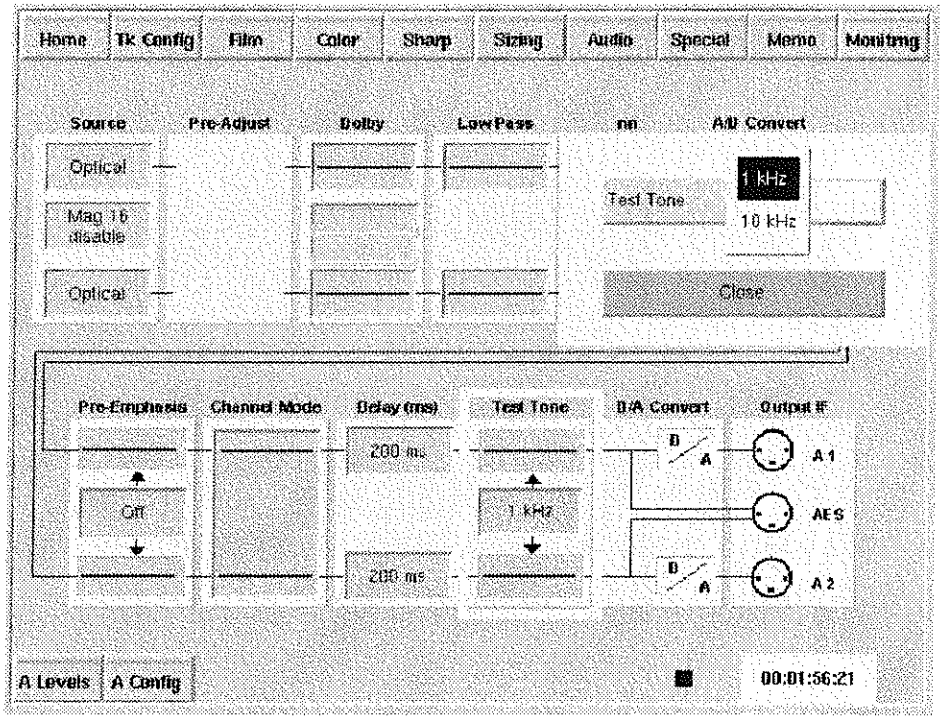


Fig. 369: Audio Config menu with window "Test Tone"

31	*Press button **Test Tone***	Window	Depending on the requirement, select 1 kHz or 10 kHz test tone.
32	*Press button **Close***	Window	Close window

33	*Press **Source** section*	Audio Config menu	The window "Setup Input Source" appears.

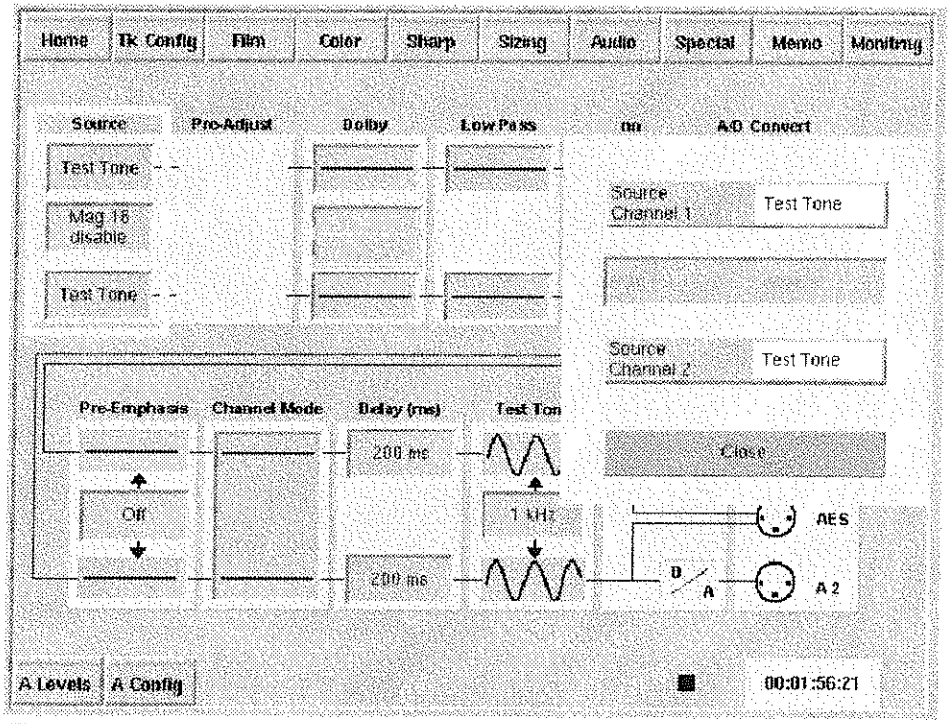


Fig. 370: Audio Config menu with window "Input Source"

34	*Press button **Source Channel 1 / 2***	Window	For **turning on** the test tone, select "TEST."
			Check film audio path in the studio.
35	*Press button **Close***	Window	Close window (and switch off test tone).

3.11.10. ADJUST THE STUDIO LEVEL

	Select	Where?	Adjust function
36	*Press menu button* ***Audio Levels***	Contr. panel	The Audio Level menu appears.
37	*Press button* ***Setup*** *&* *button* ***Studio Level***	Audio Level menu	Pulldown menu "Audio Level Setup" appears.

Note!

- The internal test tone level of the Spirit Data-Cine is at 0VU.
- Scale zero point is at the 28% audio modulation level for COM-OPT.
- The zero point of the scale is set to full scale db fs

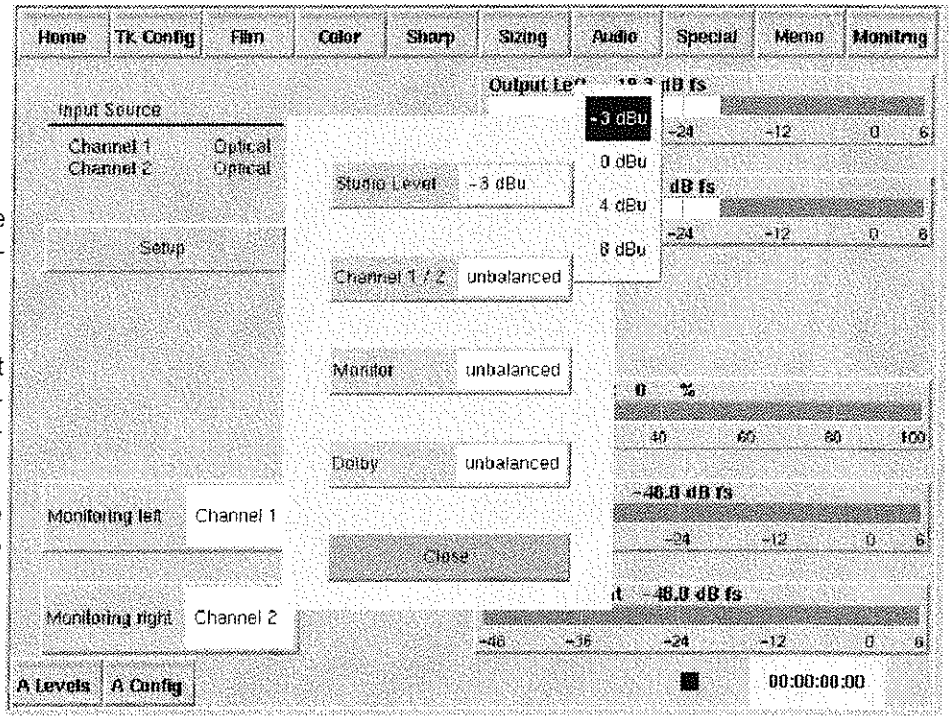


Fig. 371: Audio Level menu with window "Audio Level Setup"

38	*Touch button* ***Studio Level*** *and make your selection in the pulldown menu*	Pulldown menu	Depending on the requirement, adjust the studio level -3 dBu, 0 dBu, 4 dBu or 8 dBu.
39	*Press button* ***Close***		Close window

Note:
With unbalanced load, the audio level is automatically reduced by 6 dB, when a studio level of +4 or +8 dBu is selected.

3.11.11. ADAPT AUDIO OUTPUTS (BALANCED / UNBALANCED) TO STUDIO INPUTS

	Select	Where?	Adjust function
40	*Press button* ***Audio Level***	Contr. panel	The Audio Level menu appears.
41	*Press button* ***Setup***	Audio Level menu	Drop-down menu "Audio Level Setup" appears.

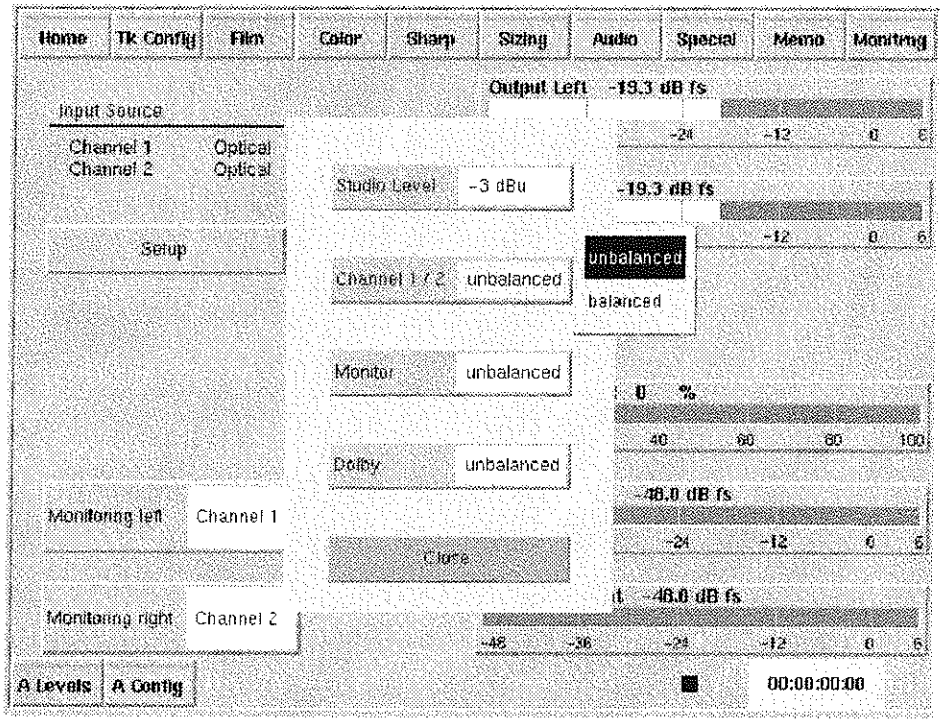


Fig. 372: Audio Level menu with window "Audio Level Setup"

42	Touch button **Channel 1/2** and make your selection **"unbalanced** or **unbalanced"**	Window	Adapt the outputs of the film scanner A1, A2, Monitoring and Dolby Stereo, according to the available studio inputs unbalanced or balanced
43	*Press button* ***Close***	Window	Close window

Note:
With unbalanced load, the audio level is automatically reduced by 6 dB, when a studio level of +4 or +8 dBu is selected.

3.11.12. ADJUST HEADPHONE & MONITORING VOLUME

	Select	Where?	Adjust function
44	*Press button* ***Audio Levels***	Contr. panel	The Audio Levels menu appears.

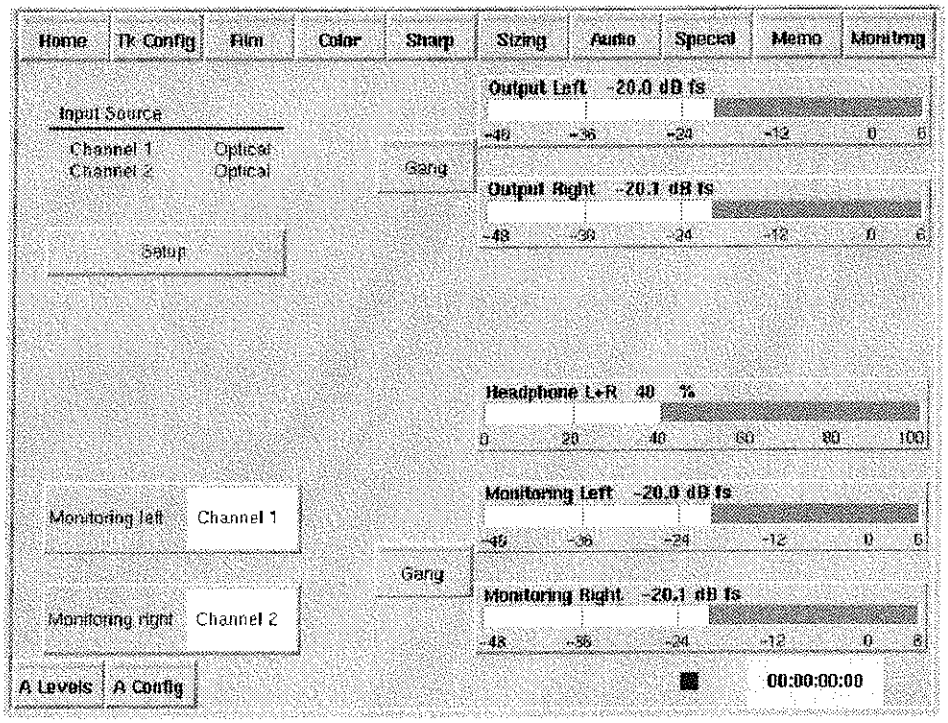


Fig. 373: Audio Level menu

45	*Touch* *Headphone* ***Mon left*** *(for mono)* ***Mon Left*** *and* ***Right*** *(for stereo)* *attenuators*	Menu	Adjust the volume controls according to requirement. To modify, slide the controls on the touch-screen ore use the digipot controls
46	*Press button* ***Close***	Contr. panel	Return to the Home menu

3.11.13. ADJUST SEPMAG CHANNELS

	Select	Where?	Adjust function
47	Press menu button **Special** & Submenu **Extern D**	Contr. panel	The sub menu Extern D appears.
48	Press button **Sepmag Coupling Source**	Menu	The pull down menu "Biphase / Timecode is opened

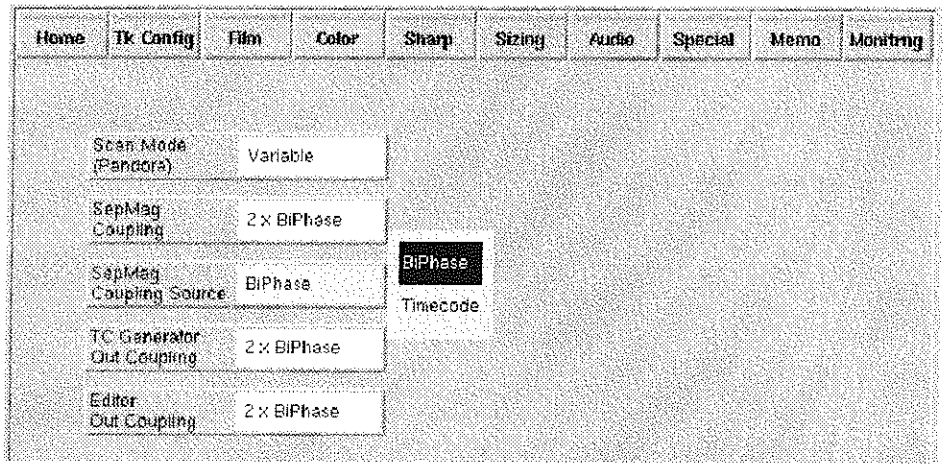


Fig. 374: Submenu Extern D

49	Select Source **"Biphase"**	Menu	
50	Select **Sepmag coupling** according to the Sepmag unit used	Menu	**2x Biphase**: for Sepmag units with 2 pulses per frame synchronization (at connection SEPMAG OUT / Rack 2) **10x Biphase:** for Sepmag units with 10 pulses per frame synchronization

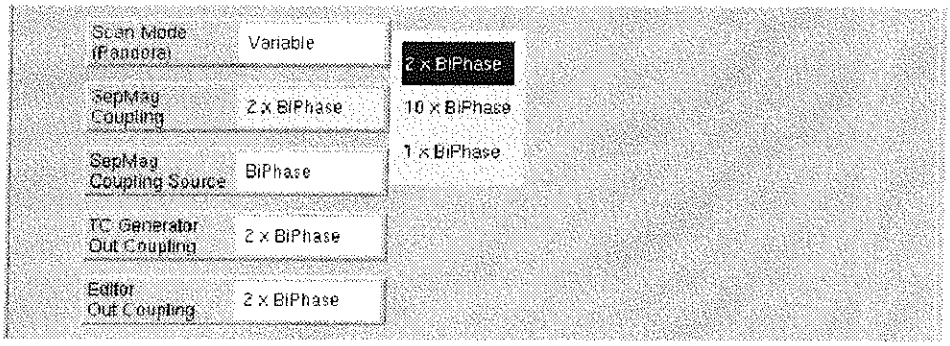


Fig. 375: Submenu Filmdeck Settings

	Select	Where?	Adjust function
51	*Press menu button* ***Audio Config***	Contr. panel	The Audio Config menu appears.
52	*Select Input* ***Source section***	Audio Config menu	The window Source Channel 1/2 appears.

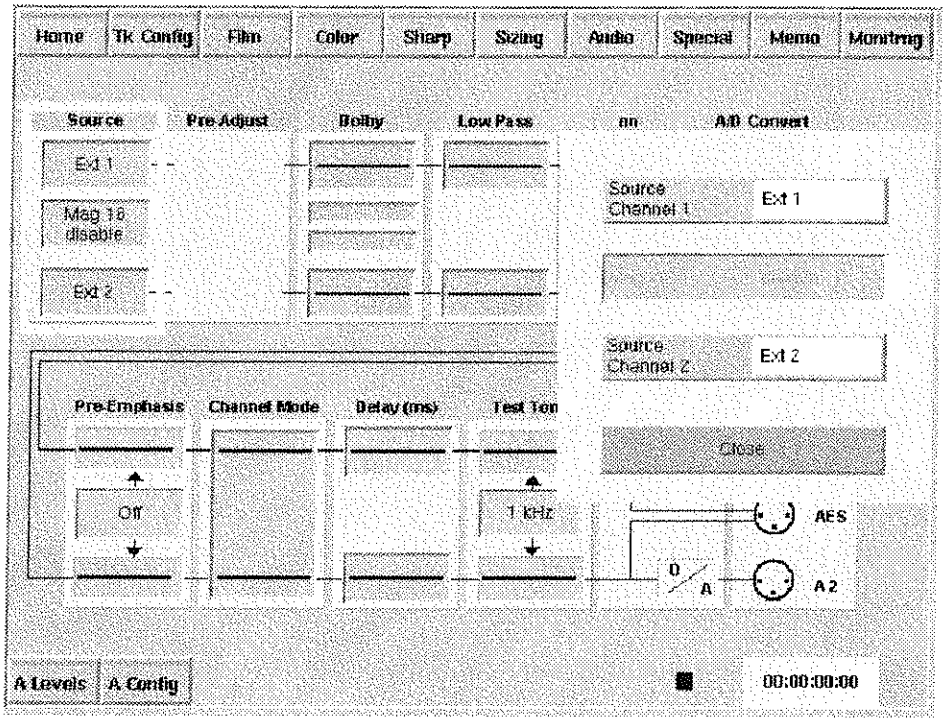


Fig. 376: Audio Config menu with window "Input Source"

53	*Press button* ***Source channel 1/2*** *&* *Select* ***Ext1 / EXT2*** *for Sepmag mode*	Window	Select the audio sources according to Sepmag unit used (mono or stereo). **Mono:** CH1, 2: each "Extern1" **Stereo:** CH1: "Extern 1" CH2: "Extern 2"
54	*Press key* ***Close***	Contr. panel	Return to the menu

4. MENU CONTROL GCP

4.1 Graphical Control Panel GCP

The highly sophisticated Graphical Control Panel GCP1 is designed to control the Spirit DataCine SDC 2001.
GCP1 replaces the former Control Panel FCP1 and provides equal functionality and user friendly operation by means of a touchscreen.

Note!

- **The general operating instructions are described in the separate GCP Manual FU 0104.**
  It provides short form instructions for an expert with experiences in operating of telecines.
- **Additional detailed information is provided in the following chapters 4.2 to 4.11**

4.1.1 CONTROL AND DISPLAY ELEMENTS GCP

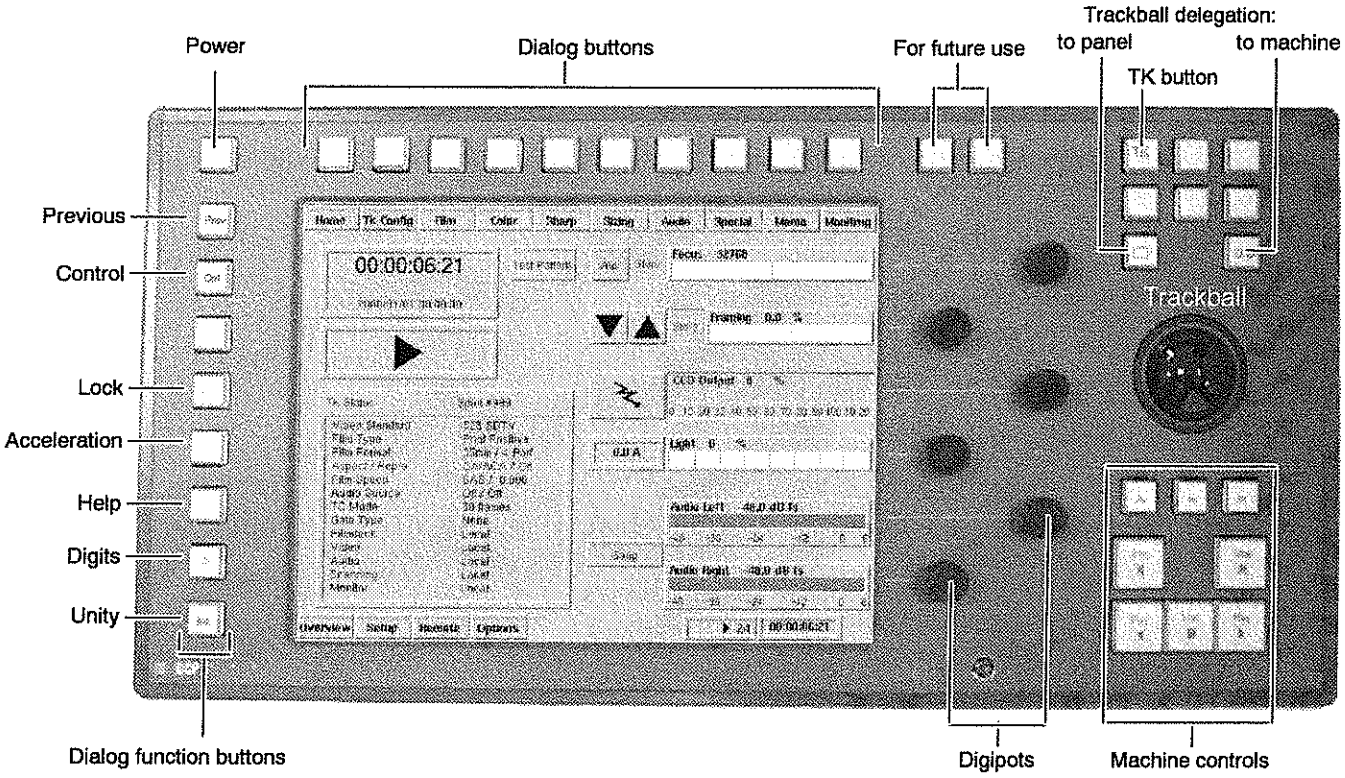


Fig. 401: Graphical Control Panel GCP1

4.1.2 MENU STRUCTURE OF GCP1

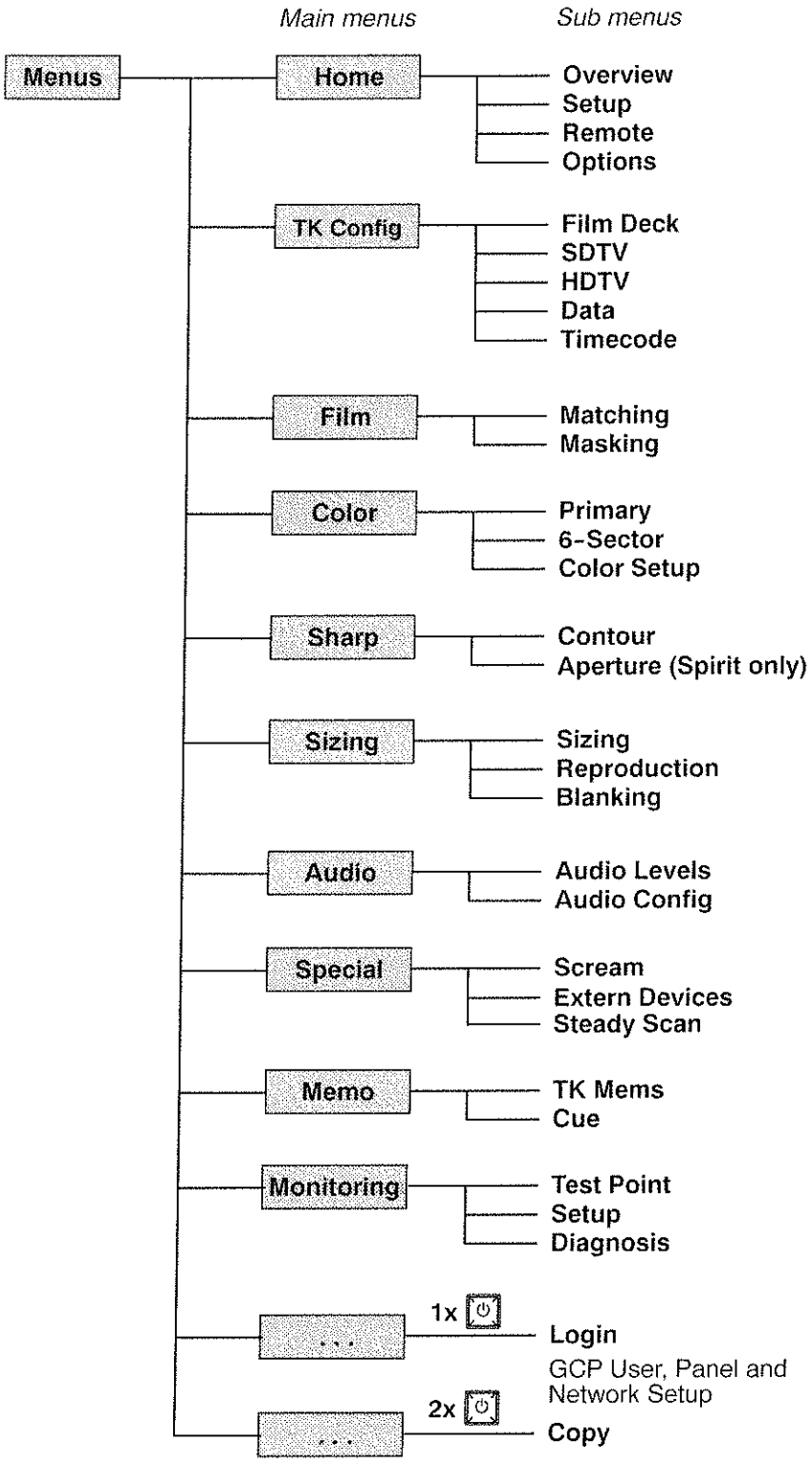
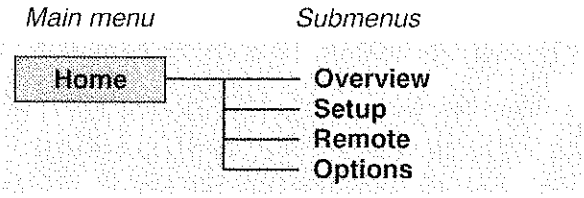


Fig. 401: Menu structure of the Graphical Control Panel GCP1

4.2 HOME MENU GCP



4.2.1 SUBMENU "OVERVIEW"

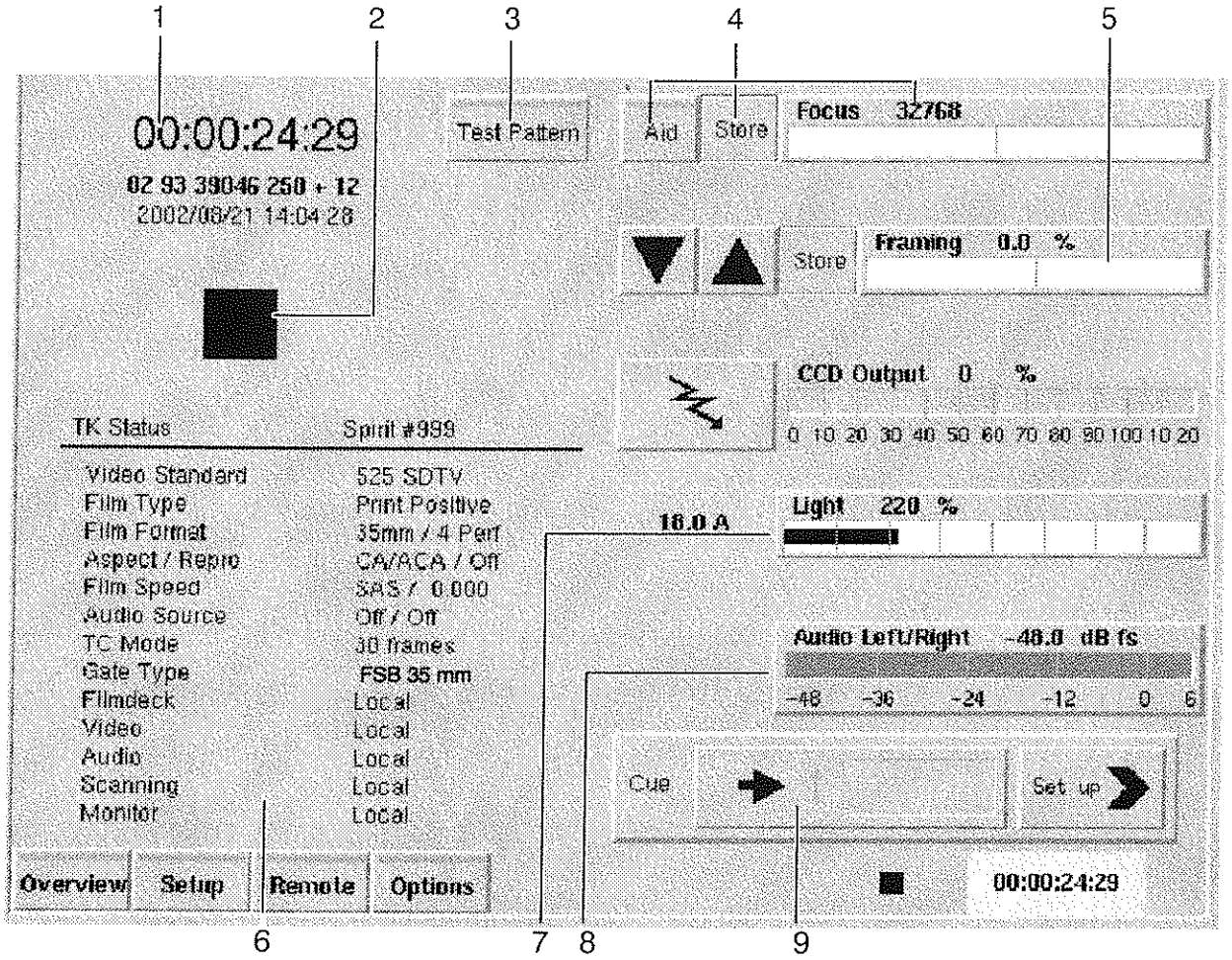


Fig. 402: Main menu **"Home"** / submenu **"Overview"**

Overview

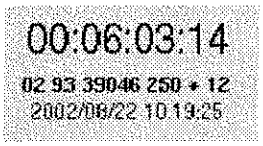
The main menu "Home" appears automatically after having switched on the film scanner.

It permits the user to handle the most important machine settings and operating modes and serves to control and display the following film scanner functions:

6. Display of current time code , date & time
7. Operating display of the film deck status
8. Test pattern selection for checking the video signal path
9. Focus adjustment to set the film sharpness
10. Framing adjustment to set the film bar position
11. General information list which provides short information about essential basic settings
12. Illumination adjustment CCD Output Level, Light and Shot to set the intensity of the film illumination
13. Audio output level indicators for the audio channels left and right
14. Cue, Cue Timecode to cue the DataCine to the defined position

Function Buttons, Controls & Displays

1. Display Current TC



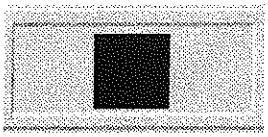
Display of current time code shows the value in

hours : minutes : seconds : frames

Additionally display of the keycode:
(Manufact. ID; Film ID; Prefix - Filmroll; Countm film lenght in feet; Offset in frames;

and date & time.

2. Operating Display



The operating display of the film deck status; informs about film drive mode (PLAY, SEARCH, STEP, film run direction, film speed, stop status, if no film is threaded ("no film") and indicates that the film scanner is operating in the remote mode ("no contr.").

3. Test Pattern

Switches the test signal on or off. The preselection of the test signal (staircase, sawtooth, color bar a.s.o.) is made in the main menu **"Home"** within submenu **"Setup"**.

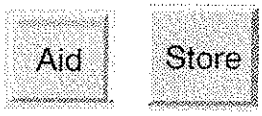
ON: test signal
OFF: film signal

4. Focus

With this bar graph, the film scanner is focused optically to the film material used.
Focussing can be done either with the digipot control or by sliding on the touchscreen.
For optimum focus adjustment it is useful to zoom into image and focus on the grain.
For a better detection of the grain, the coring adjustments in the main menu Sharp should be set to 0% and at least the aperture correction should be set to maximum.

To store the adjusted focus position.

To make focussing easier, hit the **Aid** button.



This macro function sets zoom and contour to maximum and slows down the film speed to 6 frames per second.

Thus, film grain will appear as large and clear as possible which helps to find the optimum focus position.

If the chosen value is very different from the unity setting, this should be saved as the new default.

Hitting the **Store** button opens a dialog window.

With OK, your new setting will be stored and recalled next time when **Unity** is pressed.

The default focus setting is important as this value is used during FPN and affects the quality of the FPN.

5. Framing

With this bar graph, the frame line of the film frame is coarsely shifted into the vertical blanking interval and thus made imperceptible.

coarse **"DOWN"**
Softkey assignment only available for 35mm film.
After pressing the action button ▼, the frame line is shifted by 1/4 of picture height downward.

coarse **"UP"**
Softkey assignment only available for 35mm film.
After pressing button ▲, the frame line is shifted by 1/4 of picture height upward.

adjust **"FINE"**
After pressing the bar graph framing the frame line is adjusted with the digipot.
The display in the bar graph shows the selected frame line in deviation in %.
Thus, framing adjustments become reproducible.

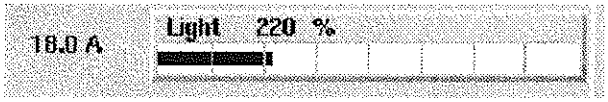
To store the framing setting.

6 Information List

The general information list provides short information about essential basic settings of the Video Standard, Film Format, Aspect / Repro, Fixed speed, Audio source, TC mode, Gate type, Filmdeck, Video, Audio, Size and Monitoring, Local and Remote Delegation.

Shot button,
serves during Play for setting the intensity of film illumination once to 100%. video level.

7. Illumination Adjustment Light

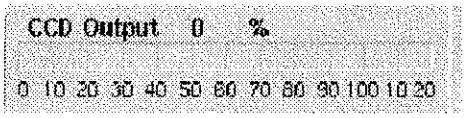


Serves for setting the intensity of film illumination and adjusting the video level and Xenon lamp current display.

Attention!
Exceeding 22A lamp current may shorten the life span of the bulb.

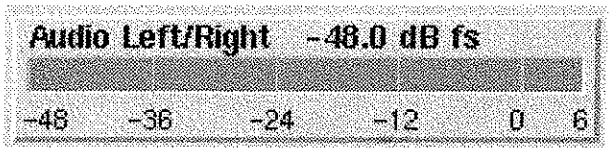
When exiting the selection, the last illumination intensity value is stored.

CCD Output



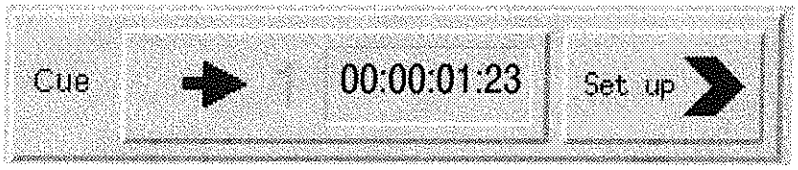
CCD Output is the signal level derived from the scanner head.
This is set using LIGHT which is the illumination or light level of the film. The aim is to achieve that sufficient light is available to capture D-Min (minimum density) of the negative or D-Max (maximum density) on a Print.
The CCD Output level should be up to 100%.

7. Audio Level Left & Right



Indicates the current audio levels of the two audio channels (Left / CH 1 and Right / CH 2) as well as the current position of the level controls for audio Out 1 and 2.

8. Cue Cue Timecode



Serves to cue the DataCine to the defined timecode visible in the button display.
If no cue point is defined or if the Setup buttons pressed, the main menu "Memo" submenu "Cue" for setup of the cue points is opened.

4.2.2 SUBMENU "SETUP"

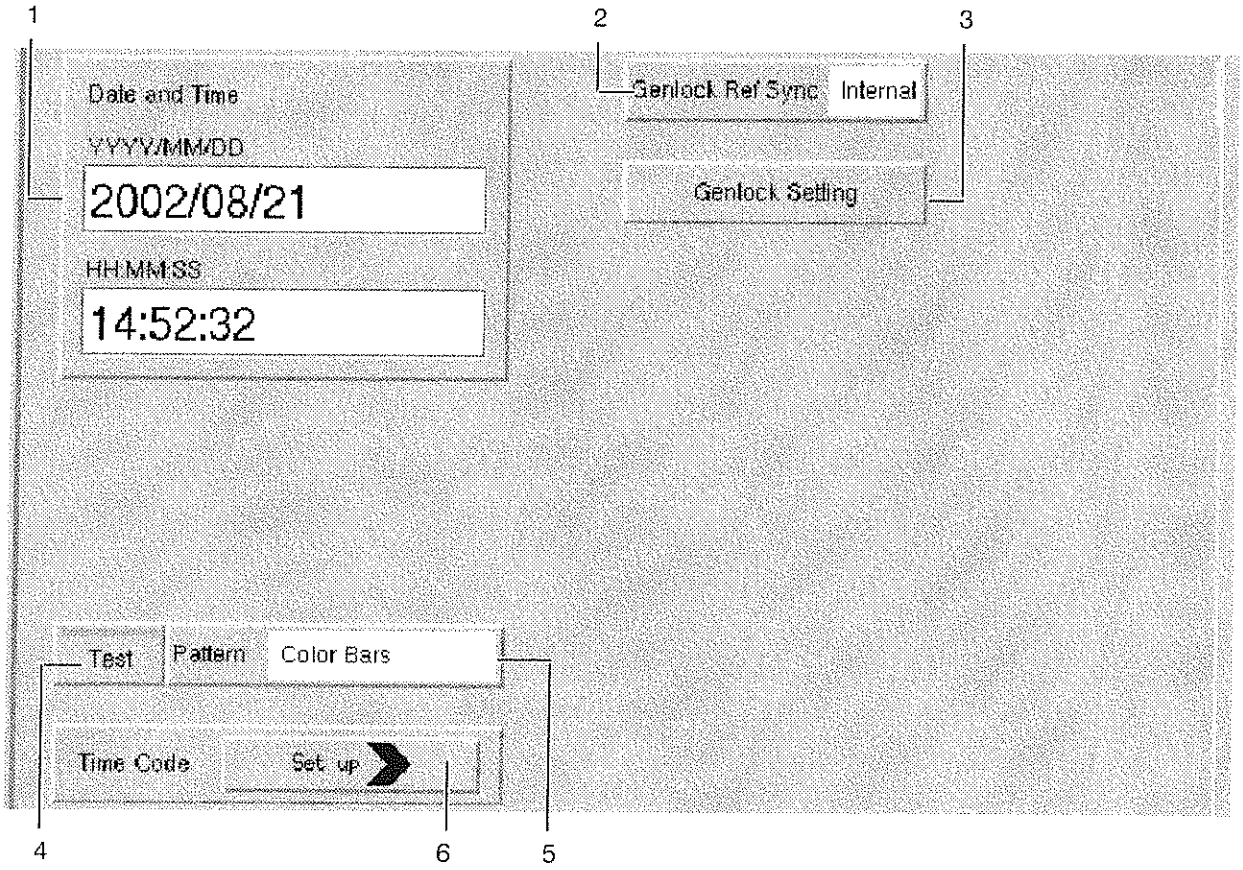


Fig. 403: Main menu **"Home"** / submenu **"Setup"**

Overview

The submenu **"Setup "** serves to set the basic settings

1. Date & Time
2. Genlock Ref Sync
3. Genlock Setting
4. Test Pattern (signal) on / off
5. Pattern selection
6. Time Code Setup

Function Buttons, Controls & Displays

1. Setting Date & Time

Select the Date & Time window

Setting Date & Time is done via numeric keyline and the action buttons (**"OK"**, **"Cancel"**, **"Clear"**, **"<--"**) at the bottom.

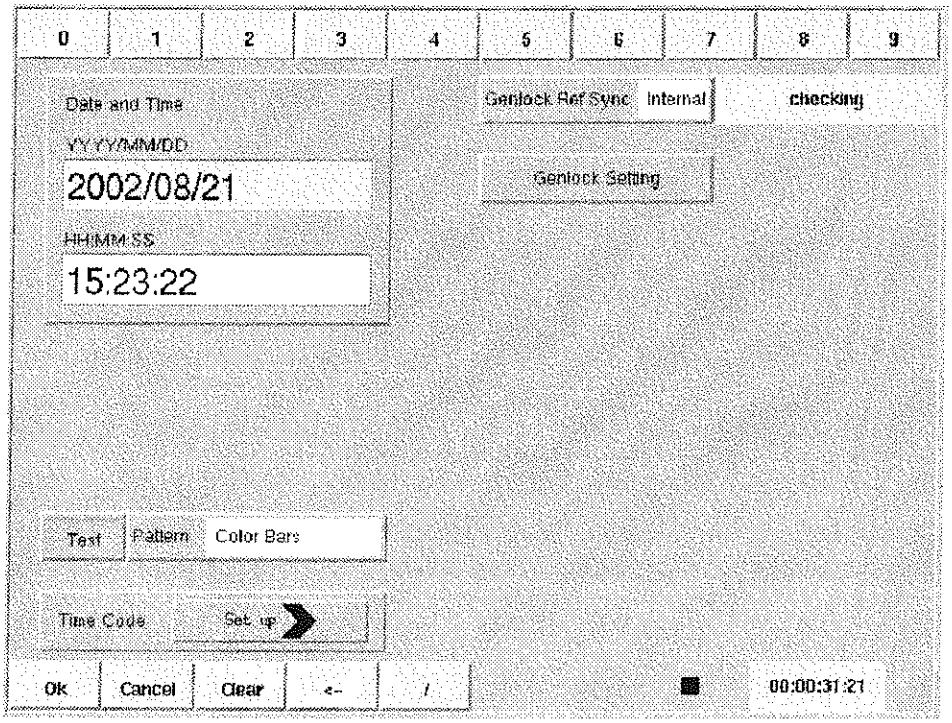
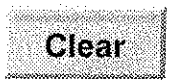


Fig. 404: Numeric keypad and control buttons in submenu **"Setup"**

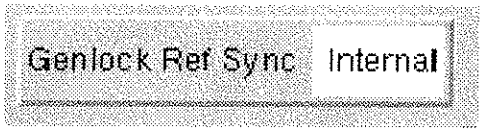
Actuating the **"Cancel"** button interrupts the film tc setting.



"Clear" sets the TC value to zero.

The button "<--" shifts the digits of the TC value backwards.

2. Genlock Ref Sync



Switches over to different genlock reference sync signals.
The meanings and the possible selections of the individual parameters are explained below.

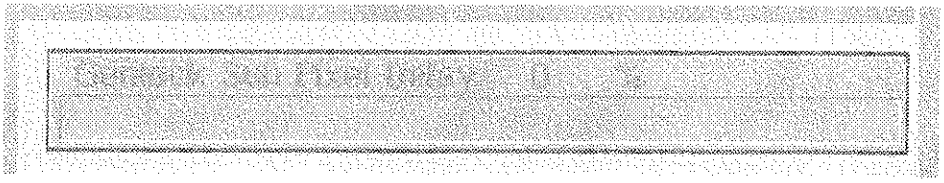
Factory adjustments are **underlined**.

Selection: **Internal** / Ext1 / Ext2 / Ext3 / Serial

"Int"	film scanner is synchronized internally (runs free)
"Ext1"	film scanner is synchronized by sync signal SYNC 1 on terminal panel Rack 3
"Ext2"	film scanner is synchronized by sync signal SYNC 2 on terminal panel Rack 3
"Ext3"	film scanner is synchronized by sync signal SYNC 3 on terminal panel Rack 3
"Serial"	film scanner is synchronized by sync signal SER REF on terminal panel Rack 3

3. Genlock Settings

Bar graph
Genlock Sub Pixel Delay



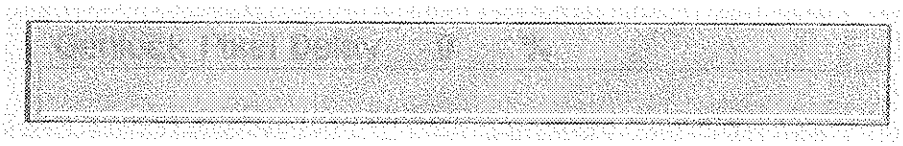
Changes the pixel delay to less than 1 pixel.

Selection: **0** / 1 to 255 pixel parts

"0 " Delay: none

"1-255" Delay: 1 to 255 pixel parts

Genlock Pixel Delay



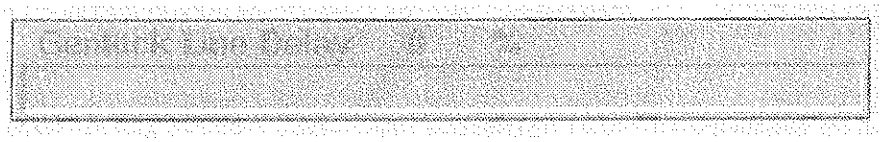
Changes the genlock delay to pixel increments.

Selection: **0** / 1 to 4095 pixels

"0" Delay: none

"1-4095" Delay: 1 to 4095 pixels

Genlock Line Delay



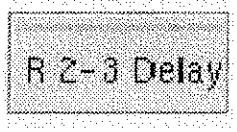
Changes the genlock delay to line increments.

Selection: **0** / 1 to 4095

"0" Delay: none

"1-4095" Delay: 1 to 4095 lines

Rack 2-3 Delay



Switches on or off Rack 2 - Rack 3 Delay

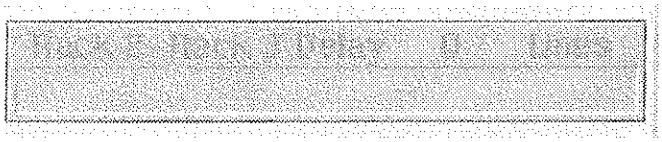
Selection: **OFF** / ON

"OFF " Delay off

"On" Delay on; value depending from parameter "Rack 2 - Rack 3 Delay"

Bar graph Rack 2-3 Delay

Note!
Parameter "Rack 2 - Rack 3 Delay" is used to match the genlock generator delay to the delay of a color corrector, operating between Rack 2 and Rack 3 (e.g. Pogle MegaDef 1)



Changes the genlock delay from 0 to 30 ore more line increments

Selection: **0** / 1 to 30 lines

"0 " Delay: none

"1-30" Delay: 1 to 30 lines

4. Test Pattern

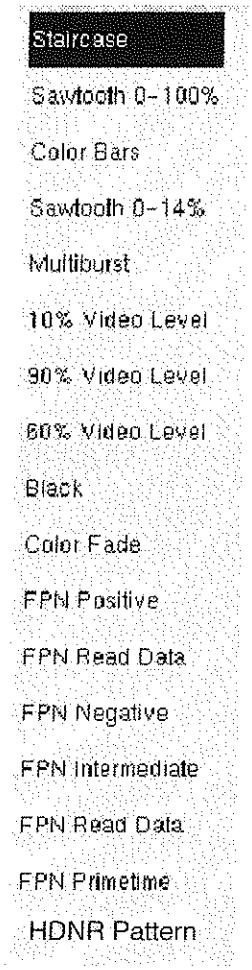
Switches the test pattern (-signal) on or off. The preselection of the test signal (staircase, sawtooth, color bar) is made in the dropdown menu "Pattern" within submenu **"Setup"**.

ON: test signal

OFF: film signal

5. Pull down menu Pattern This pulldown menu serves to select the test signals.

Overview
The meanings of the individual test signals are explained below.



"Staircase"
Test signal "staircase"

"Sawtooth_100"
Test signal "sawtooth 0 -100%"

"Colorbar"
Test signal "color bar"

"Saw_14"
Test signal "Ramp 0 -14%"

"M-Burst"
Test signal "Multiburst "

"10%"
Test signal "10% video level, for monitor adjustment" *

"90%"
Test signal "90% video level, for monitor adjustment" *

* To achieve this video levels, set following parameters:
Color correction - unity; CRT gamma - on; film type - Print pos.;

"60%Are"
Test signal "60% video level (area)"

"Black"
Test signal "black"

"FPNPos"
Test signal "positive FPN correction signal"

"FPN Rd"
Test signal "last stored FPN correction data"

"FPNNeg"
Test signal "negative FPN correction signal"

"FPNIM"
Test signal "Intermediate FPN correction signal"

"FPN Rd"
Test signal "last stored FPN correction data"

"FPNPT"
Test signal "Primetime FPN correction signal"

The current selection is shown on the key display. If it reads "HDNR Pattern", a SCREAM Test Pattern is active.

6. Time Code Setup

This button opens the main menu "TK Config" / submenu "Time Code" as described in chapter 4.3 Menu TK Config, submenu TC

4.2.3 SUBMENU "REMOTE"

If a film scanner has to be controlled from several remote panels (FCP and GCP), consider the following:

In order to avoid problems with parallel operation, the default setting of the GCP should always be REMOTE 2. When changing the remote address of the GCP, the film scanner has subsequently to be restarted.

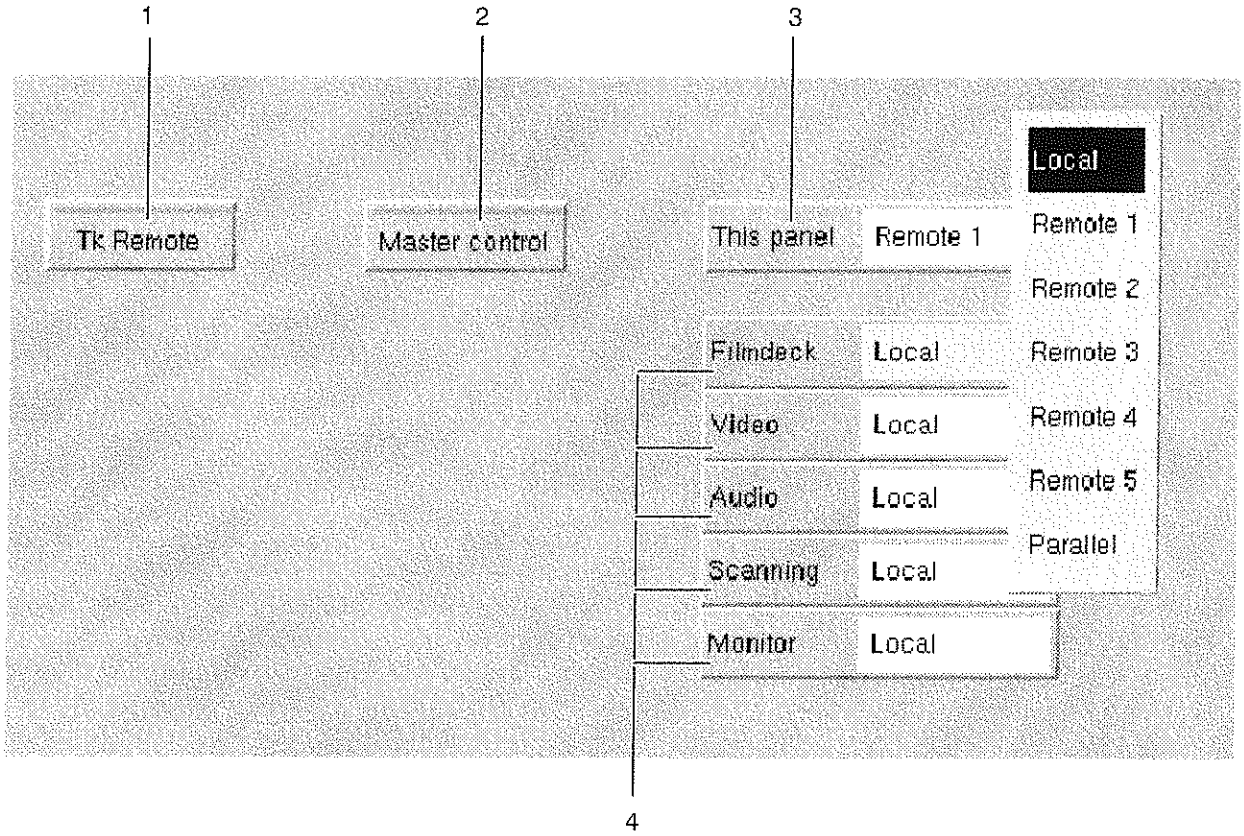


Fig. 405: Submenu **"Remote"**

This submenu serves to select the control interfaces for Film Deck, Video- Audio Amps, Scanning System and Monitoring from which the film scanner is remote-controlled via the adequate pulldown menu.

(Connections, see manual Planning and Installation)

Overview

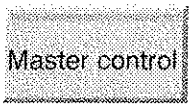
1. Tk Remote switch
2. Master Control switch
3. Pulldown menu "This Panel"
4. Pulldown menus for controlling the film scanner functions

Function Buttons, Controls & Displays

1. TK Remote

The Tk Remote toggle switch delegates the selected control functions of the film scanner either to the GCP (Rem1) or to the local control panel.

2. Master Control

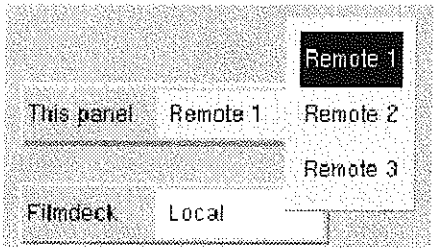


The **"Master control"** button sets all remoteable functions like filmdeck, video & audio amps, the scanning system and monitoring selection to Remote1 or Local control.

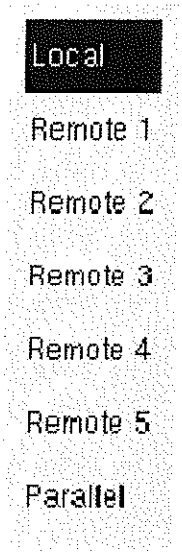
3. This Panel

For connecting the GCP to Remote 1 - 3

If a film scanner has to be controlled from several remote panels (FCP and GCP), consider the following:
In order to avoid problems with parallel operation, the default setting of the GCP should always be REMOTE 2. When changing the remote address of the GCP, the film scanner has subsequently to be restarted.



4.1 Filmdeck



Selects remote interface for the **film deck.**
For controlling the **filmdeck**, optionally via the own (local) control panel or an external control panel.
Rem 1 to 3 are iMCS (Cheapernet) control connections.
Rem 1 is provided for the Graphical Control Panel and Rem 2 and 3 for external color corrections.
Rem 4, 5 are RS422 interfaces for connecting an editor or a filmdeck control panel. Only for future use.
Para. is a parallel interface for connecting a control panel with reduced filmdeck functions.

4.2 Video

Selects remote interface **VIDEO**

The function but applies to control of the **video amplifier**, alternatively local or external via Rem 1 to Rem 3.

4.3 Audio

Selects remote interface **AUDIO**

The function applies to control of the **audio amplifier**, alternatively local or external via Rem 1 to Rem 3.

4.4 Scanning

Selects remote interface **Scanning**

The function applies to control of the **sizing**, alternatively local or external via Rem 1 to Rem 3.

4.5 Monitor

Select remote interface **MONITOR**

The function applies to control of the **monitoring**, alternatively local or external via Rem 1 to Rem 3.

4.2.4 SUBMENU "OPTIONS"

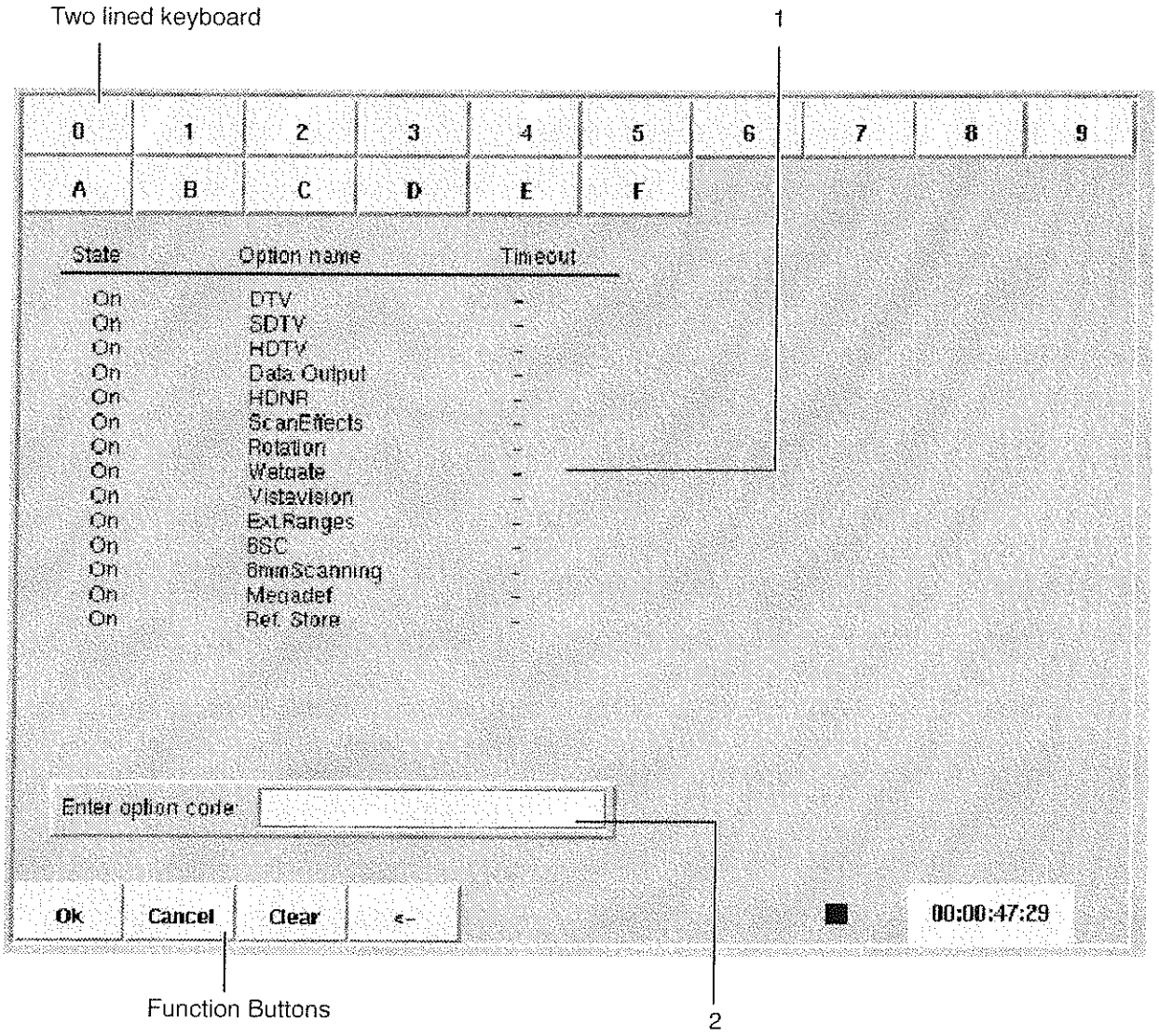


Fig. 406: Submenu **"Options"** with the numeric data keypad and control buttons

This submenu displays the activated and available options of the film scanner. Entering the appropriate **"option code"** from the Philips "License Document" activates the desired features.

Overview

1. Display of active and available options

2. Edit field for the entering the license code

Function Buttons, Controls & Displays

2. Enter option code

Selecting the **"Enter option code"** edit field opens a two lined keyborard with numbers 0 to 9 and characters A to F above the display and the control buttons

"OK",

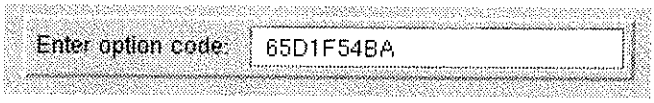
"Cancel",

"Clear" and **"<--"**

on the bottom side of the submenu.

The option code can be input by using the data keyboard. It writes the option code into the **"Enter option code"** display.

To enter the option code, press the **"OK"** button.



Note!

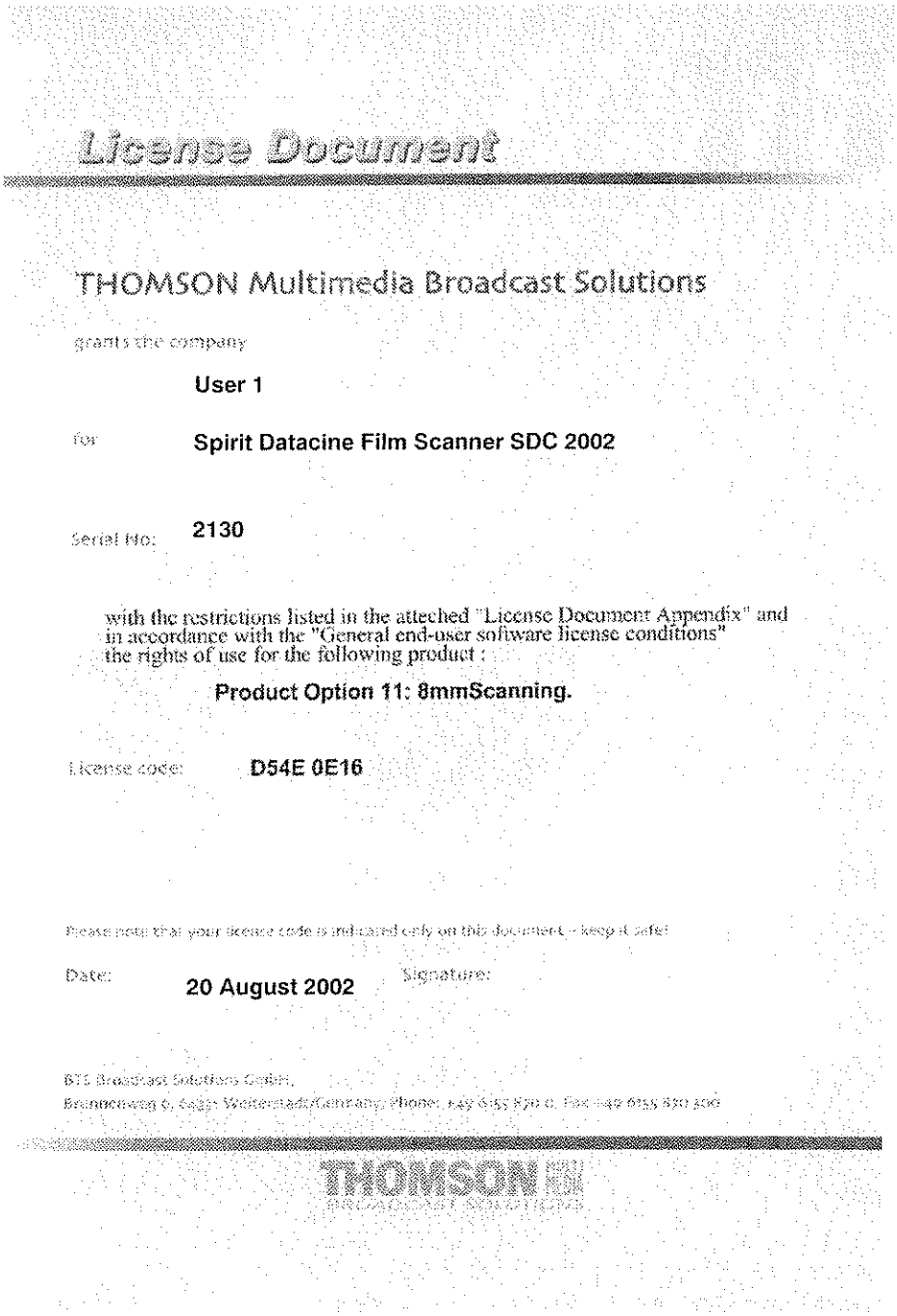
The **"Enter option code"** is cancelled automatically after a while without any actions.

The license code string consists of 5 times 4 characters or numbers.

If the decoding of the license code string was successful the menu shows the name of the new option.
If this option has a time limit, this limit will be shown in the column **"Timeout"**.

An error message **"invalid license code!"** appears, if the Spirit DataCine film scanner cannot decode the license code string.
Perhaps you made a typing error during entry or the license document belongs to another Spirit DataCine film scanner.

In this case verify the product type and the serial no. of the DataCine / Telecine shown in the main menu Diagnosis corresponds to the entries in the License Document(s).



License Document

THOMSON Multimedia Broadcast Solutions

grants the company

User 1

for Spirit Datacine Film Scanner SDC 2002

Serial No: 2130

with the restrictions listed in the attached "License Document Appendix" and in accordance with the "General end-user software license conditions" the rights of use for the following product :

Product Option 11: 8mmScanning.

License code: D54E 0E16

Please note that your license code is indicated only on this document ! - keep it safe!

Date: 20 August 2002 Signature:

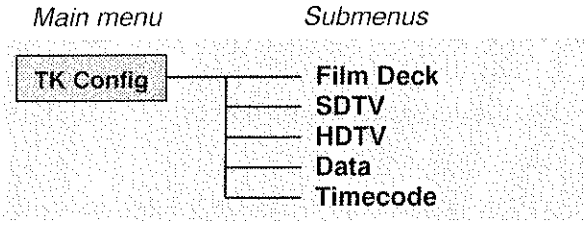
BTS Broadcast Solutions GmbH,
Brunnenweg 9, 64331 Weiterstadt/Germany, Phone: +49 6151 870 0, Fax: +49 6151 870 206

THOMSON

Fig. 407: License Document

Now you can enter another License Code or leave the submenu **"Options"**.

4.3 TK CONFIG



4.3.1 SUBMENU "FILM DECK"

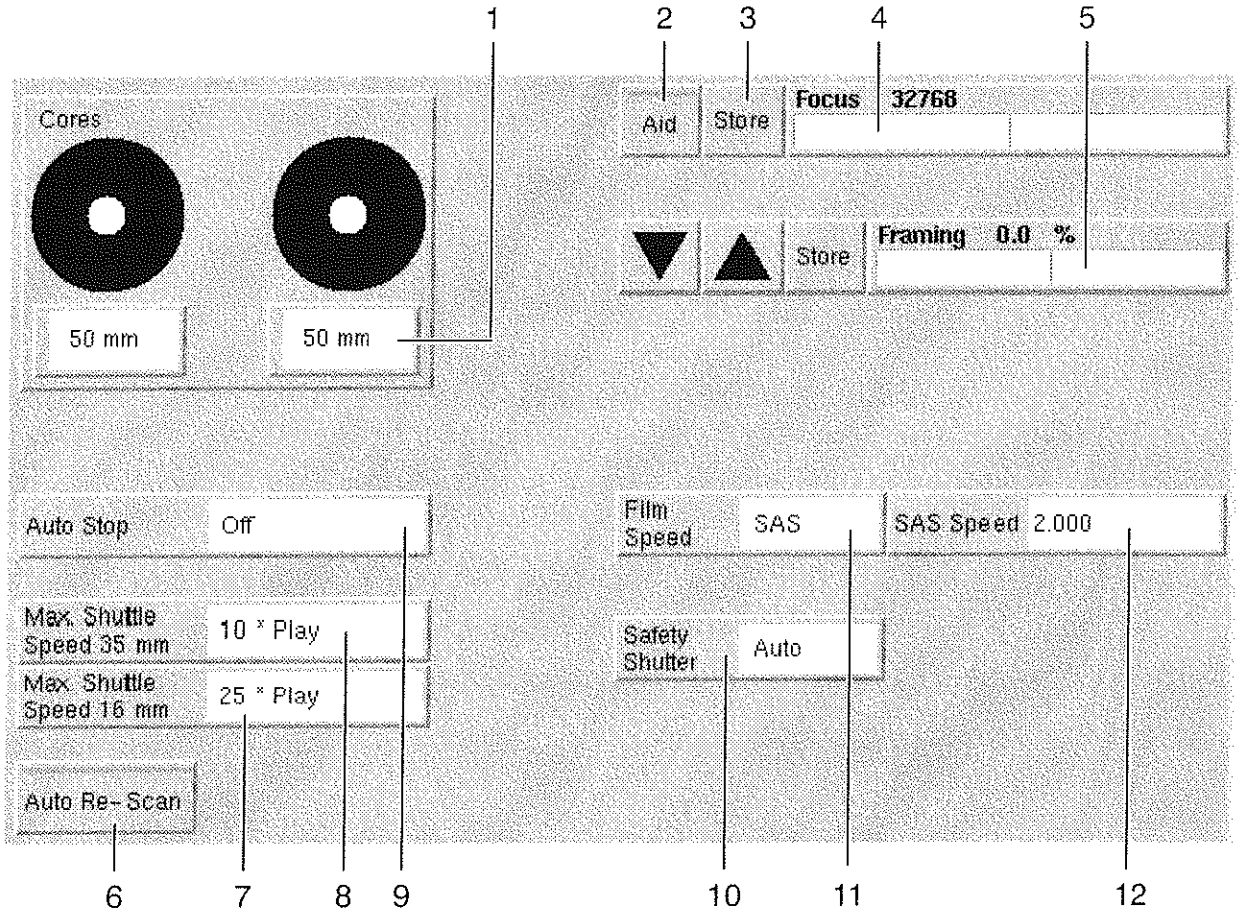


Fig. 408: Main menu **"Tk Config"** / submenu **"Film Deck"**

Overview

The main menu **"Tk Config"** / submenu **"Film Deck"** serves to configure the following Film Deck settings:

1. Cores, diameter left and right
2. Aid, helptext for focus adjustment
3. Focus Store to store the current focus setting
4. Focus adjustment to set the film sharpness
5. Framing adjustment to set the film bar position
6. Auto Re-Scan function on / off

7. Max. Shuttle Speed 16 mm setting, for 16 mm film
8. Max. Shuttle Speed 35 mm setting, for 35 mm film
9. Auto Stop selection on / off
10. Safety Shutter mode selection
11. Film Speed selection
12. SAS Speed display, displays the adjusted variable film speed

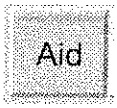
Function Buttons, Controls & Displays - Filmdeck

1. Cores

"Cores" diameter left / right
Adjustment of the used bobbin or film reel diameters (separately for the left and right reel spindle).
Important for determining the correct film supply indication and for the function "auto stop" (see below)!

Selection: 50, **75**, 100, 124, 150 mm
(Philips recommends not to use 45 and 50 mm bobbins).

2. Aid



Calls a helptext for focus adjustment

3. Focus

With this bar graph, the film scanner is focused optically to the film material used.
For optimum focus adjustment it is useful to zoom into image and focus on the grain.
For a better detection of the grain, the coring adjustments in the main menu Sharp should be set to 0% and at least the aperture correction should be set to maximum.

4. Store

Stores the current focus setting as a "unity" value (default value).

5. Framing

With this bar graph, the frame line of the film frame is coarsely shifted into the vertical blanking interval and thus made imperceptible.

coarse **"DOWN"**
Softkey assignment only available for 35mm film.
After pressing the action button ▼, the frame line is shifted by 1/4 of picture height downward.

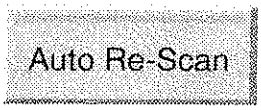
coarse **"UP"**
Softkey assignment only available for 35mm film.
After pressing button ▲, the frame line is shifted by 1/4 of picture height upward.

adjust **"FINE"**
After pressing the bar graph framing the frame line is adjusted with the digipot.
The display in the bar graph shows the selected frame line in deviation in %.
Thus, framing adjustments become reproducible.

To store the framing setting.

6. Auto Re-Scan

Automatic read-in of the changed frame into the frame store.
(after focus, illumination, 6 dB gain, film type changes etc.)



Selection: Off / On

7. Max. Shuttle Speed 16 mm

Determines the maximum shuttle speed for 16 mm films.

Selection: 2 to **25 times the normal speed**

8. Max. Shuttle Speed 35 mm

Determines the maximum shuttle speed for 35 mm films.

Selection: 2 to **10 times the normal speed**

9. Auto Stop

Determines automatic Film Deck stop shortly before film end.
Attention: adjust always the correct "core diameter" (see above)!

Selection: **off** / Shuttle / Shuttle + Play

"off"	automatic Film Deck stop switched off
"Shuttle"	automatic Film Deck stop only in shuttle mode
"Shuttle + Play"	automatic Film Deck stop in shuttle and play modes

10. Safety Shutter

This pull down menu serves to close the safety shutter (lens cap) of the film scanner and to switch on the automatic safety shutter control.

Selection: Open / Closed / Auto

"Open"	safety shutter open
"Closed"	safety shutter closed (film heat-protection)
"Auto"	automatic safety shutter control switched on

11. Film Speed

This pull down menu serves to adjust the fixed or variable film speed for the film scanner.

Fixed film speeds at **625/1250L/50Hz**:
6 1/4, 12 1/2, 18 3/4, 25 and 50 frames/s
as well as a preselected variable film speed (SAS = Select a Speed)

Fixed film speeds at **525/1125L/60Hz**:
6, 12, 18, 24, 30 and 48 frames/s
as well as a preselected variable film speed (SAS = Select a Speed)

12. SAS Speed

Selected **SAS**, the film scanner is changed over to a **variable** film transport speed.
The bar graph **"SAS Speed"** shows the variable film speed adjusted last. The film scanner will then run at this speed.
The display, attached to the bar, shows the selected variable film speed in FPS (frames per second). Thus, film speed adjustments become reproducible.

Variable film speeds SAS:
Range from **2.000** to **57.000** fps for all standards.

For setting push the **"SAS Speed"** bar graph.
Numerical buttons will appear at the top of the screen.
Type the requested speed and enter with the Ok-button below.

4.3.2 SUBMENU "SDTV"

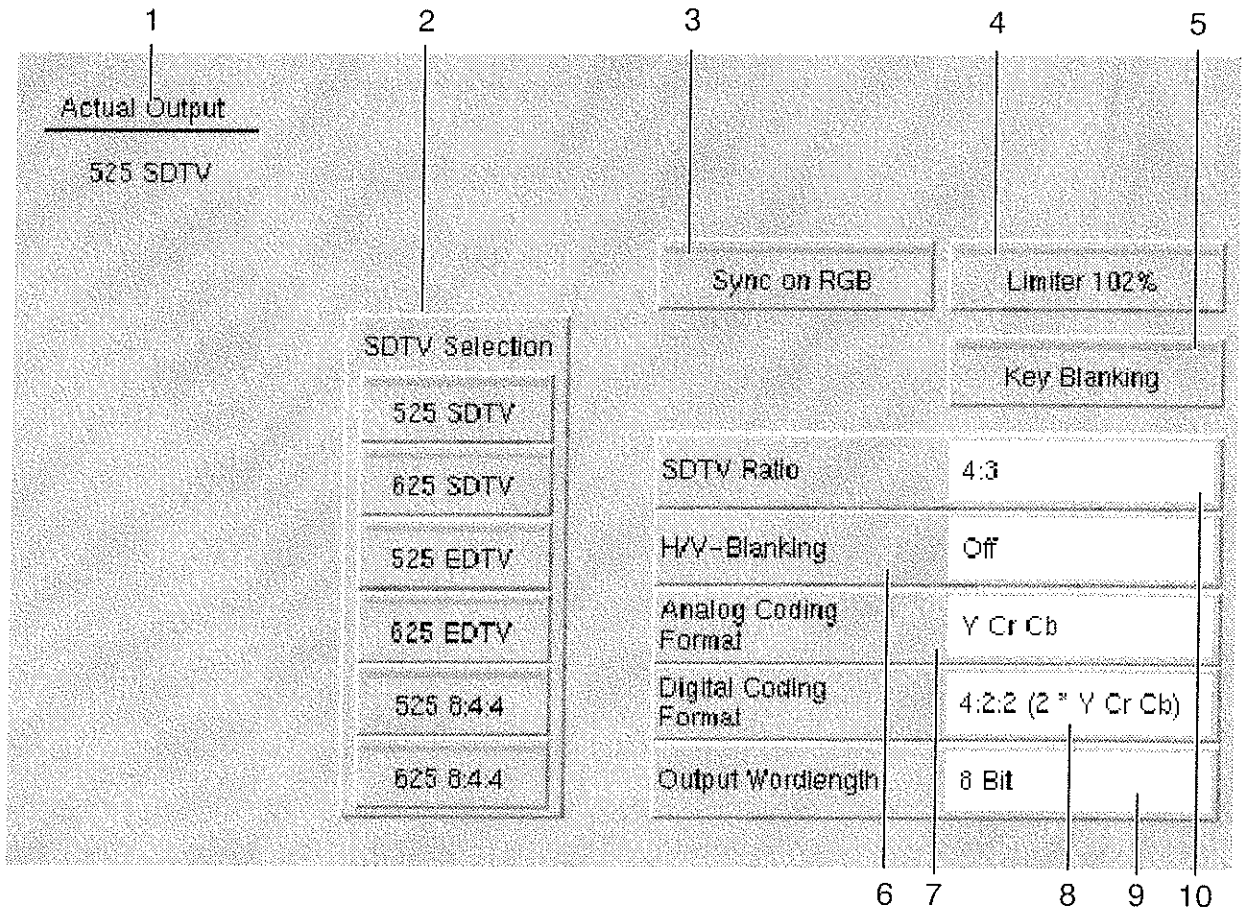


Fig. 409: Main menu **"Tk Config"** / submenu **"SDTV"**

Overview

The submenu **"SDTV"** serves to perform video basic adjustments for SDTV outputs:

1. Actual Output to display the actual output (SD)TV standard
2. SDTV Selection to select the (SD)TV standards
3. Sync on RGB to switch on or off the Sync signal in the RGB signal
4. Limiter 102% to switch on or off the 102% video limiter
5. Key Blanking to switch on or off the key blanking
6. H/V-Blanking to switch the horizontal and vertical blanking
7. Analog Coding Format to define the mode of the analog SDTV outputs
8. Digital Coding Format to switch the 4:2:2, 4:2:2:4, 4:4:4:4, GBR KBR or the GR KB mode on
9. Output Wordlength to switch the wordlength in the digital output signal from 8 to 10 bits
10. SDTV Ratio picture aspect ratio for the TV output picture 4:3 / 16:9

Function Buttons, Controls & Displays

1. Actual Output

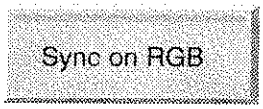
The display shows the actual output (SD)TV standard.

2. SDTV Selection

With these function buttons the following **(SD)TV** standards can be selected:

525_SDTV	SDTV standard with 525 lines / 60 Hz
625_SDTV	SDTV standard with 625 lines / 50 Hz
525_EDTV	EDTV standard with 525 lines / 60 Hz
625_EDTV	EDTV standard with 625 lines / 50 Hz
525_8:4:4	8:4:4 standard with 525 lines / 60 Hz
625_8:4:4	8:4:4 standard with 625 lines / 50 Hz

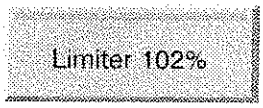
3.



With this function button the Sync signal in the RGB signal can be switched on or off.

Selection: **off** / on

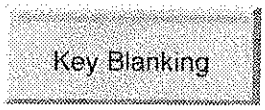
4.



With this function button (in SDTV OUTPUT only) the 102% video limiter can be switched on or off.

Selection: **off** / on

5.



With this function button (in SDTV OUTPUT only) the key blanking can be switched on or off.

Selection: **off** / on

6. H/V-Blanking

This pull down menu serves to switch the horizontal and vertical blanking off or on or to narrow blanking values.

Selection: **Off** / Norm / Narrow

"Off"	H and V blanking switched off
"Norm"	H and V blanking switched to standard norm
"Narrow"	H and V blanking switched to narrow blanking (has no effects in HDTV standards)

7. Analog Coding Format

This pull down menu serves to define the mode of the analog SDTV outputs.

Selection: **YCrCb** / RGB

"YCrCb"	YCrCb operation
"RGB"	RGB operation

8. Digital Coding Format

This pull down menu serves to switch the 4:2:2, 4:2:2:4, 4:4:4:4, GBR KBR or the GR KB mode on.

Selection: **4:2:2** / 4:2:2:4 / 4:4:4:4 / GBR KBR / GR KB

"4:2:2 (2* YCrCb)"	4:2:2 mode switched on Link A: Y, C_B, C_R Link B: Y, C_B, C_R Luminance with halfband filtered chrominance according to CCIR 601/656
"4:2:2:4 (Y Cb Cr/K)"	4:2:2:4 mode switched on Link A: Y, C_B, C_R Link B: K, 0, 0 Link A: Luminance with halfband filtered chrominance according to CCIR 601/656 Link B: with Key, Chrominance off
"4:4:4:4 (Y/K Cb Cr)"	4:4:4:4 mode switched on Link A: Y, C_{B0}, C_{R0} Link B: K, C_{B1}, C_{R1} Link A: Luminance and even unfiltered chrominance Link B: Key and odd unfiltered chrominance
"4:4:4:4 (GBR KBR)"	GBR KBR mode switched on Link A: G, B_0, R_0 Link B: K, B_1, R_1 Link A: Green and even unfiltered blue and red Link B: Key and odd unfiltered blue and red

9. Output Wordlength

This pull down menu serves to switch the wordlength in the digital output signal from 8 to 10 bits.

Selection: **8 Bit** / 10 Bit

10. SDTV Ratio

Picture aspect ratio for the TV output picture.
Selection:

"4 : 3"	4:3 output picture
"16 : 9"	16:9 output picture

4.3.3 SUBMENU "HDTV"

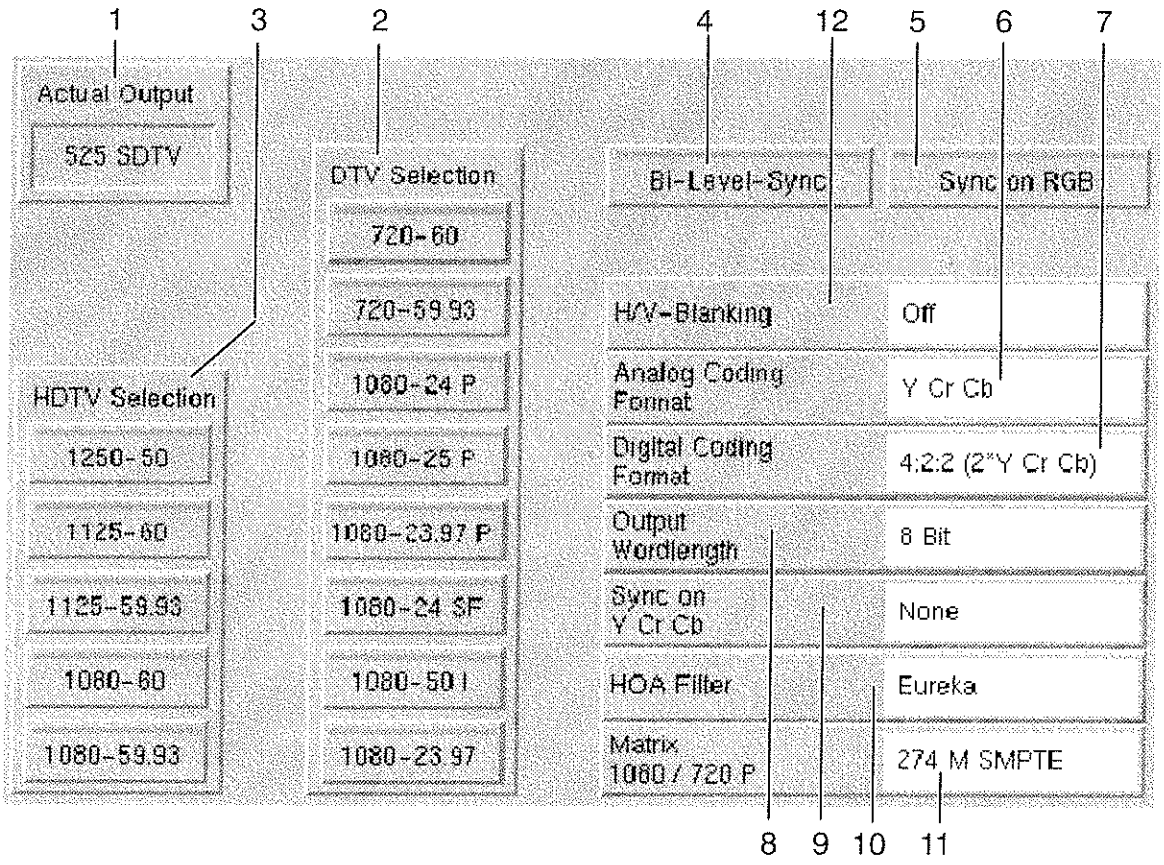


Fig. 410: Main menu **"Tk Config"** / submenu **"HDTV"**

Overview

The submenu **"HDTV"** serves to perform video basic adjustments for HDTV and DTV outputs:

1. Actual Output to display the actual output HDTV or DTV standard
2. DTV Selection to select the DTV standards
3. HDTV Selection to select the HDTV standards
4. Bi-Level-Synch to switch on or off the bi / tri-level sync signal
5. Sync on RGB to switch on or off the Sync signal in the RGB signal
6. Analog Coding Format to define the mode of analog SDTV outputs
7. Digital Coding Format to switch on the 4:2:2, 4:2:2:4, 4:4:4:4, GBR KBR or the GR KB mode
8. Output Wordlength to switch the wordlength in the digital output signal from 8 to 10 bits
9. Synch on YCrCb to switch the sync signal in the YCrCb signal (in HDTV Output only)
10. HOA Filter to select the analog output filter for HDTV or future standards
11. Matrix 1080 / 720 P to switch-over the matrix coefficients between SMPTE_240M and SMPTE 274 / 296M
12. H / V Blanking to switch the horizontal and vertical blanking

Function Buttons, Controls & Displays

1. Actual Output This display shows the actual output HDTV or DTV standard.

2. DTV Selection With these function buttons the following **DTV** standards can be selected:

720_60	DTV standard with 720 active lines / 60 Hz **
720_59.93	DTV standard with 720 active lines / 59.93 Hz **
1080_24 P	DTV standard 1920x(1080 active lines) / 24 Hz progr.**
1080_25 P	DTV standard 1920x(1080 active lines) / 25 Hz progr.**
1080_23.97 P	DTV standard 1920x(1080 active lines) / 23.97 Hz progr.**
1080_24 sF	DTV standard 1920x(1080 active lines) / 24 Hz segmented Frame**
1080_50 I	DTV standard 1920x(1080 active lines) / 50 Hz interlaced**
1080_23.97 sF	DTV standard 1920x(1080 active lines) / 23.97 Hz segmented Frame**

** = Options FH 1675 HDTV Output and FH 1635 DTV are required

3. HDTV Selection With these function buttons the following **HDTV** standards can be selected:

1250_50	HDTV standard with 1152 active lines / 50 Hz *
1125_60	HDTV standard with 1035 active lines / 60 Hz *
1125_59.93	HDTV standard with 1035 active lines / 59.93 Hz *
1080_60	HDTV standard with 1080 active lines / 60 Hz *
1080_59.93	HDTV standard with 1080 active lines / 59.93 Hz *

* = Option FH 1675 HDTV Output is required

4.

Bi-Level-Sync

With this function button the bi / tri-level Sync signal can be switched on or off.

Selection: **off** / on

A bi / tri-level SDTV Sync signal is provided at J 40 **"SDTV SYNC OUT"** and in the green channel **G/Y** or via the separate **S** output in HDTV, DTV, SDTV and Data mode.
The output is especially designed for the vertical synchronization of telecine controllers.
The signal pattern only depends on the frame rate of the selected video standard.
(for more details see Mounting & Operating Instructions FU 0103: **"HDTV / DTV Output"**, chapter 2.1.1 and 6.1)

5.

Sync on RGB

With this function button the Sync signal in the RGB signal can be switched on or off.

Selection: **off** / on

6. Coding Format

This pull down menu serves to define the mode of analog SDTV outputs.

Selection: **YCrCb** / RGB

"YCrCb"	YCrCb operation
"RGB"	RGB operation

7. Digital Coding Format

"Digital Coding Format"
This pull down menu serves to switch on the 4:2:2, 4:2:2:4, 4:4:4:4, GBR KBR or the GR KB mode.

Selection: **4:2:2** / 4:2:2:4 / 4:4:4:4 / GBR KBR / GR KB

"4:2:2 (2* YCrCb)"	4:2:2 mode switched on Link A: Y, C_R, C_B Link B: Y, C_R, C_B Luminance with halfband filtered chrominance according to CCIR 601/656
"4:2:2:4 (Y Cr Cb/K)"	4:2:2:4 mode switched on Link A: Y, C_R, C_B Link B: K, 0, 0 Link A: Luminance with halfband filtered chrominance according to CCIR 601/656 Link B: with Key, Chrominance off
"4:4:4:4 (Y/K Cr Cb)"	4:4:4:4 mode switched on Link A: Y, C_{R0}, C_{B0} Link B: K, C_{R1}, C_{B1} Link A: Luminance and even unfiltered chrominance Link B: Key and odd unfiltered chrominance
"4:4:4:4 (GBR KBR)"	GBR KBR mode switched on Link A: G, B_0, R_0 Link B: K, B_1, R_1 Link A: Green and even unfiltered blue and red Link B: Key and odd unfiltered blue and red
"GRKB"	GR KB mode switched on Link A: G_0, G_1, G_2, G_3, ... / R_0, R_1, R_2, R_3, ... Link B: K_0, K_1, K_2, K_3, ... / B_0, B_1, B_2, B_3, ... Link A: all green and than all red signals Link B: all Key and than all blue signals

8. Output Wordlength

"Output Wordlength"
This pull down menu serves to switch the wordlength in the digital output signal from 8 to 10 bits.

Selection: **8 Bit** / 10 Bit

9. Sync on Y Cr Cb

"Sync on Y Cr Cb" (in HDTV Output only)
Switches the Sync signal in the YCrCb signal

Selection: **None** / Y / Stand / All

"**None**" No Sync signal in video

"**Y**" Sync only inserted in Y signal

"**Stand**" 1250 Sync only in Y signal
1080 Sync in all channels: Y Cr Cb

"**All**" Sync in all channels: Y Cr Cb

10. HOA Filter

(in HDTV Output only)

Selects the analog output filter for HDTV or future standards.
Default filter equipment on board HOA FY 6314.xx:
Filter bank 1 : Eureka
Filter bank 2 : Full Bandwidth
The equipped filters are displayed on the control panel

Selection: **Auto** / Eureka / Full Bandwidth

"**Auto**" Selects the filter depending on the TV format at the analog HDTV outputs
Format 1250 , 1125, 1080
Filter: Eureka
other Formats Filter optional

"**Eureka**" Eureka filter is selected in **all** analog HDTV modes

"**Full Bandwith**" Filter is bypassed in **all** analog HDTV modes

The selected filter is displayed on the control panel

11. Matrix 1080 / 720 P

R'G'B' to Y'C'$_R$ C'$_B$ matrix coefficients for the HDTV standards 1280*720/60P and 1920*1080/60I can be switched-over between SMPTE **240M** and SMPTE 274 / 296M

"**274M**" coefficients according to SMPTE 274 and 296M

"**240M**" coefficients according to SEMPTE 240M

12. H/V-Blanking

This pull down menu serves to switch the horizontal and vertical blanking off or on or to narrow blanking values.

Selection: **Off** / Norm / Narrow

"**Off**" H and V blanking switched off
"**Norm**" H and V blanking switched to standard norm
"**Narrow**" H and V blanking switched to narrow blanking
(has no effects in HDTV standards)

4.3.4 SUBMENU "DATA"

Note!
GSN Phantom Transfer Engine Package 111 - TE 2111 is required!
If Transfer Engine TE 2101 (HiPPI Serial Data Output) is used the different control buttons and displays are described in the chapter 4.3.4.2 on page 4-73.

Menu button **"Data "**

opens dialog **"Data Output"**

4.3.4.1 Submenu Data with Option GSN Transfer Engine TE 2111

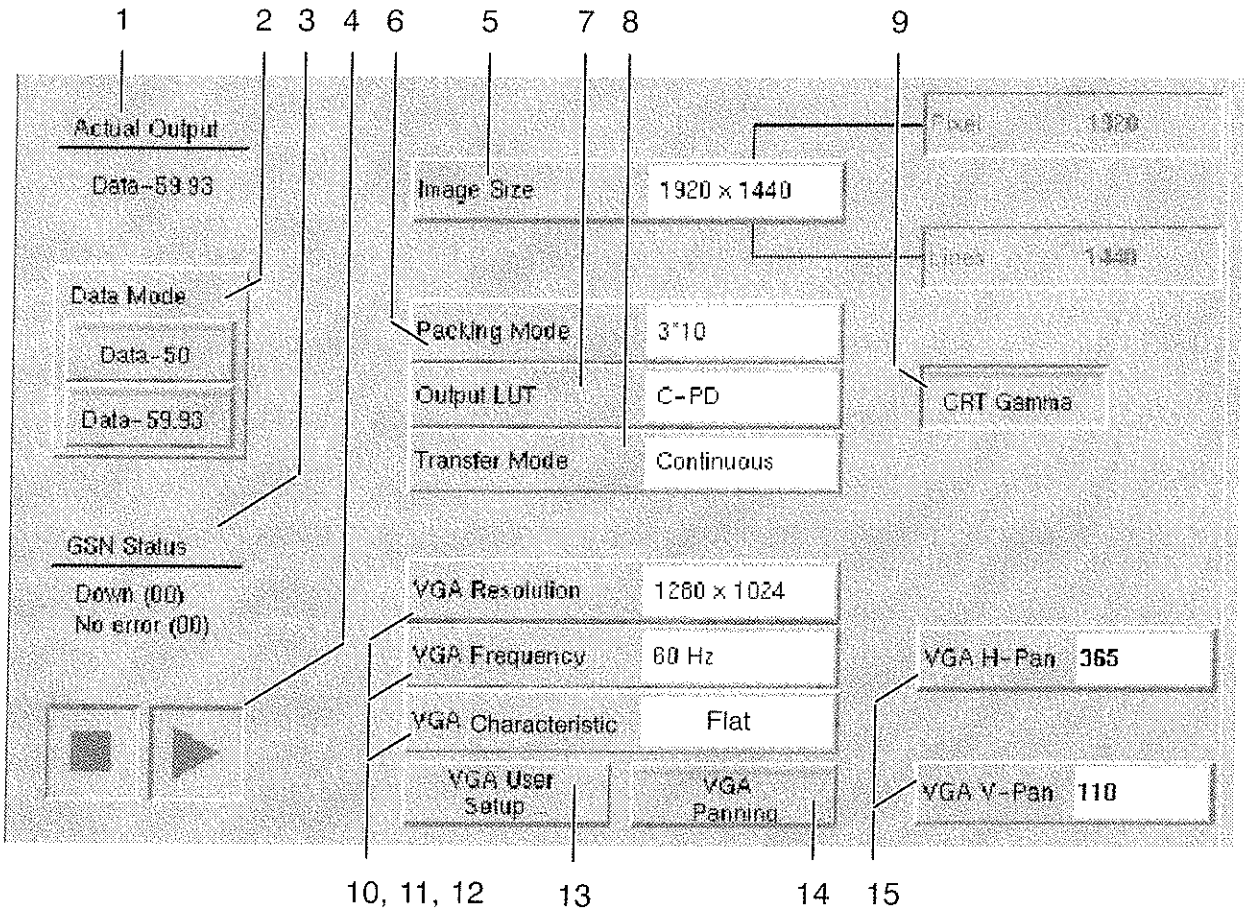


Fig. 411: Main menu **"Tk Config"** / submenu **"Data"**

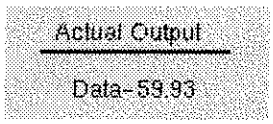
Overview GSN Output

The submenu **"Data"** allows the film scanner to be set up for Data Output Mode. The function is supported with option GSN Phantom Transfer Engine TE 2111. In Data Mode SDTV and HDTV outputs are switched off.

1. Actual Output to display the selected standard
2. Data Mode 50 / 59.93 selection
3. GSN (Gigabit Serial Network) status (Option TE 2111 required)
4. Start and Stop button for the data transfer
5. Image Size to define horizontal and vertical resolution for the data output
6. Packing mode to define the data sequences of different video components / data words
7. Output LUT maps the output data to different levels and characteristics
8. Transfer Mode provides different data flows
9. CRT Gamma switch
10. VGA Resolution for horizontal pixels and vertical lines settings
11. VGA Frequency for the vertical frame rate of the VGA monitor
12. VGA LUT to adjust the color temperature of the used VGA monitor type
13. VGA User Setup opens the window for adjustments in the VGA Interface
14. VGA Panning on / off enables or disables the image positioning on the preview monitor
15. VGA H / V Pan serves for positioning the VGA monitor image size (max. 1280x1024) within the scanned image size (max. 2048x1536)

Details of Function Buttons, Controls & Displays

1. Actual Output



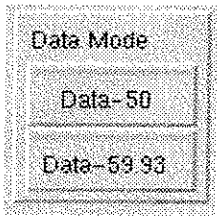
The display **"Actual Output"** shows the actual standard.

2. Data Mode

With function buttons **"Data Mode"** the following standards can be selected:

"Data_50"
Selects Data Mode 50 Hz, if the option Data Output (e.g. Phantom Transfer Engine TE 21101/2111) is available.
All sync outputs and the time code are set to Video Mode 1250 / 50 / 2:1

Time code is generated in 50 Hz Mode (25 frames/s)
Available fixed speeds are 6.25, 12.5, 18.66, 25, 50
Genlock generator is switched to 1250 / 50
SDTV Sync Out provides a 625 / 50 sync signal



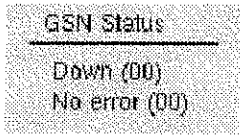
"Data_59.9"
Selects Data Mode 59.94 Hz, if the option Data Output (e.g. Phantom Transfer Engine TE 21012111) is available.
All sync outputs and the time code are set to Video Mode 1125 / 59.94 / 2:1

Time code is generated in 59.94 Hz Mode (23.98 frames/s)
Available fixed speeds are 6, 12, 24, 30, 48
Genlock generator is switched to 1125 / 59.94
SDTV Sync Out provides a 525 / 59.94 sync signal

Note:
In Data Mode SDTV and HDTV outputs are switched off.

3. GSN Status

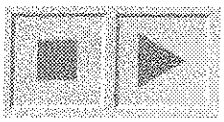
The display **"GSN Status"** shows the following possible messages:



"Down 00"	Link state is not yet known, only used at startup
"Down 01"	Link is down
"Down 02"	Link is coming up - checking far end
"Down 03"	Link is waiting for far end to report type
"Up 0a"	Link is up, but connected type is unknown
"Up 0b"	Link is up, loopback plug detected
"Up 0c"	Link is up, direct connected to host
"Up 0d"	Link is up, GSN switch detected
"Ready"	added to above values for Output (DIP -> Host) ST connection valid
"Error 00"	t.b.d.
"Error 01"	t.b.d.

4. Transfer Start / Stop

The function button **"Transfer Start"** starts the data transfer in the GSN / HIPPI data channel. Operates only in Transfer Mode "Frame by frame".

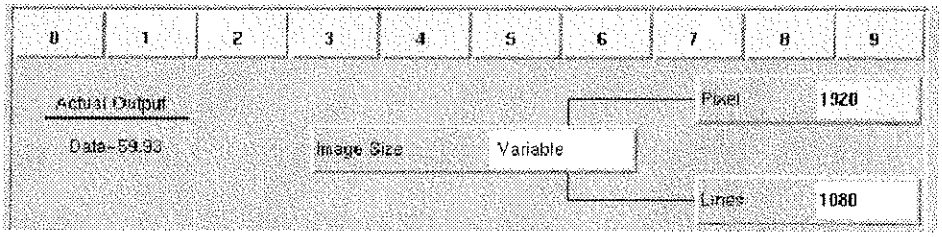


Note:
In this moment the film scanner must be in the locked play operation, not during run-up time.
(Button "Lock" on the Control Panel is lit).

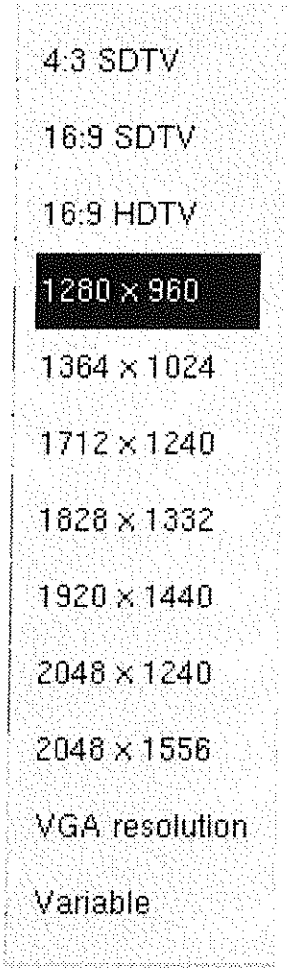
The function button **"Transfer Stop"** stops the data transfer in the GSN / HIPPI data channel. Operates only in Transfer Mode "Frame by frame".

Note:
In this moment the film scanner must also be in synchronal play operation (do not stop before).

5. Image Size



This pull down menu serves to select:
"Variable" (variable dimensions)
to define vertical and horizontal resolution of the data output with:
"Pixel"
for the horizontal image size of the data output in **pixels per line**.
The actual pixel number is displayed.
"Lines"
for the vertical image size of the data output in **lines per image**.
The actual line number is displayed.



"4 : 3 SDTV" (fixed dimensions)
to display the horizontal and vertical image size for 4:3 SDTV at the data output. Image size ratio: 720 pixels x 540 lines.

"16 : 9 SDTV" (fixed dimensions)
to display the horizontal and vertical image size for 16:9 SDTV at the data output. Image size ratio: 720 pixels x 405 lines.

"16 : 9 HDTV" (fixed dimensions)
to display the horizontal and vertical image size for 16:9 HDTV at the data output. Image size ratio: 1920 pixels x 1080 lines.

only GSN I.F. **"1280 x 960"** (fixed dimensions)
Image size 1280 pixels x 960 lines.
Square pixel scan for 4:3 SXGA monitoring based on 1280 pix.

only GSN I.F. **"1364 x 1024"** (fixed dimensions)
Image size 1364 pixels x 1024 lines.
Square pixel scan for 4:3 SXGA monitoring based on 1024 pix.

only GSN I.F. **"1920 x 1440"** (fixed dimensions)
Image size 1920 pixels x 1440 lines.
4:3 scan based on HDTV horizontal resolution

only GSN I.F. **"2048 x 1240"** (fixed dimensions)
Image size 2048 pixels x 1152 lines.
Super 16 mm scan

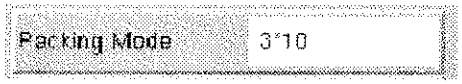
only GSN I.F. **"2048 x 1536** (fixed dimensions)
Image size ratio 2048 pixels x 1536 lines.
Full Aperture 35 mm 4-perf scan

"VGA Resolution"
Image size equivalent to the selected VGA resolution

"1828 x 1332" (fixed dimensions)
Image size 1828 pixels x 1332 lines.
Academy 35 mm 4-perf scan

"1712 x 12402" (fixed dimensions)
Image size 1712 pixels x 1240 lines.
Standard 16mm scan

6. Packing Mode



Puts data words of diverse video components together to data sequences to transmit them with a certain data rate in the GSN data channel.

Selection GSN I.F.:

3x8+0, **3x10**, 3x10Y-(10bit), 2x16Y (16bit),

GSN I.F.

"3x8+0" 3 component data words + Alpha set to "0" with 8 bit resolution each are put together to a 32 bit data word (e.g.: R, G, B, 0).

"3x10" 3 component data words with 10 bit resolution each are put together to a 32 bit data word with padding at bits 0 and 1 (e.g.: R, G, B).

"3x10Y" 3 luminance data words with 10 bit resolution each are put together to a 32 bit data word with padding at bits 30 and 31 (e.g.: Y1, Y2, Y3).

"2x16Y" 2 luminance data words with 16 bit resolution each are put together to a 32 bit data word (e.g.: Y1, Y2).

7. Output LUT

Output Lookup tables

With these settings the image data can be mapped to level ranges which are required by different applications.

Selection:

Grading on Video Monitors	**TVLEV** / GRLEV / TV_PD / TV-G
Grading on graphical Displays	DXR / DXR-G / C-PD / LOG
free programmable, user defined LUT	User Tab 01 - 15

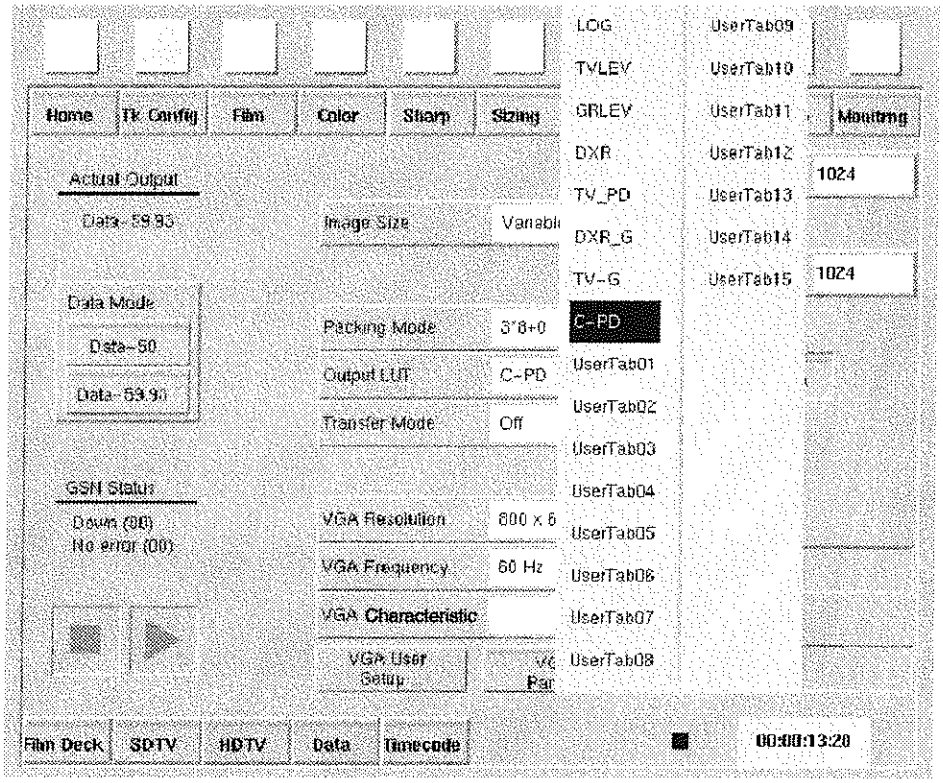


Fig. 412: Main menu "Tk Config" / submenu "Data", pulldown menu "Output LUT"

Function of Lookup Tables

Lookup tables (LUT) are used to map signal levels to the required level, range and input characteristics of different downstream products and applications.

They are basically tables containing code values. These do not necessarily describe a simple mathematical function, but are rather results of subjective tests and research.

Therefore, it is very important to understand how these lookup tables work in order to preserve the required image information.
Lookup tables can be applied at the output and / or input of many products and software applications.
It is essential to take the time and effort to analyze and test the entire chain to find out the best lookup table combinations and setups for each application.

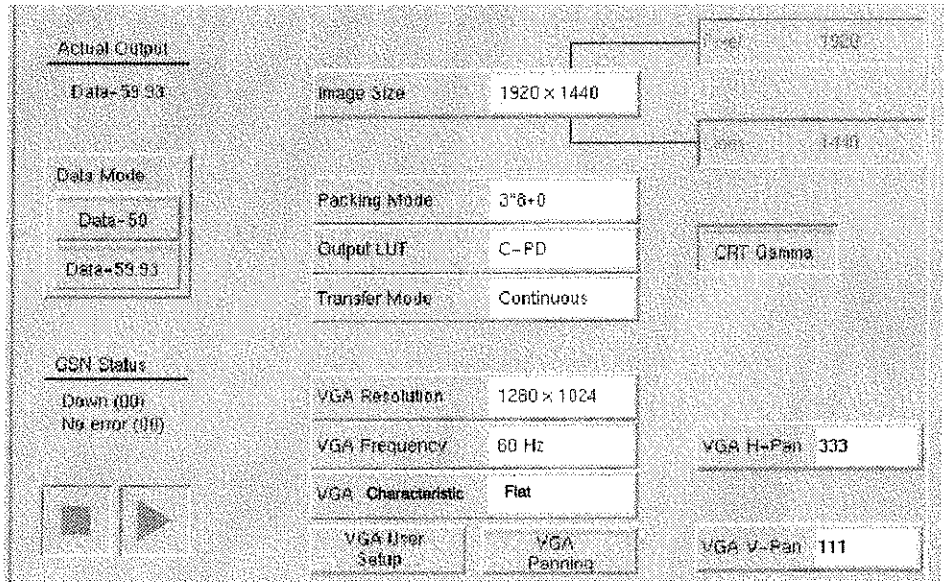
User defined LUT

This menu allows to use customer specific lookup-tables. To generate and perform a download of lookup-tables to a data output board see the detailed description of the separate SDCMAINT manual provided in the supplements of the "Spirit DataCine Customer's Manual".

Setup
Data Output

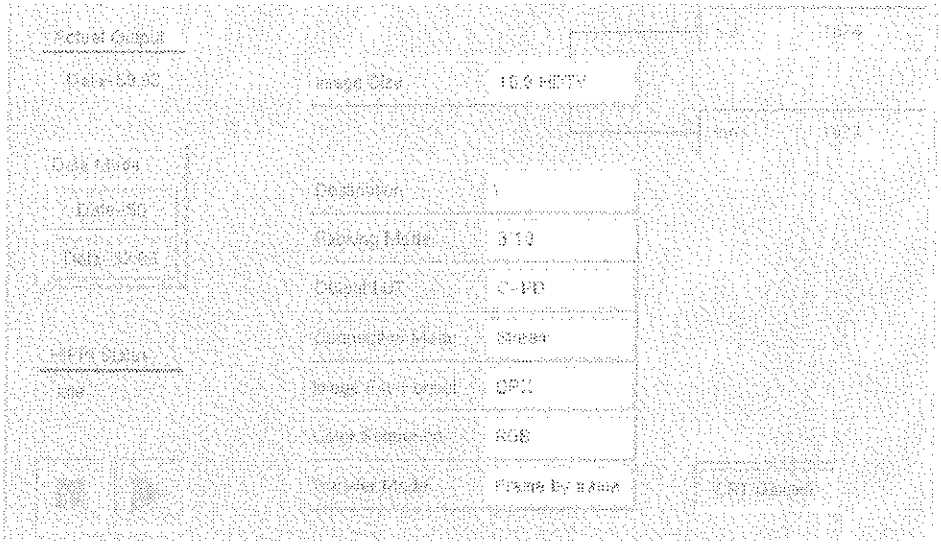
All setups regarding the data output can be found in the submenu data.
Here you set up the format of the data file and the HIPPI link connection parameters:

GSN I.F.



- Packing Mode default 3 * 10 bit
- Output LUT selected transfer lookup table
- Transfer Mode default frame by frame
- **VGA Setup only for GSN I.F.** - details see item 10

HIPPI I.F.



- Destination default 1, routing over HIPPI switch / only HIPPI I.F.
- Connection Mode default stream / only HIPPI I.F.
- Image File Format default DPX / only HIPPI I.F.
- Color Sequence default RGB / only HIPPI I.F.

Waveform Monitor For transfers with the following lookup tables you should use your monitoring waveform as a reference for signal levels as you are used to work for standard video applications.

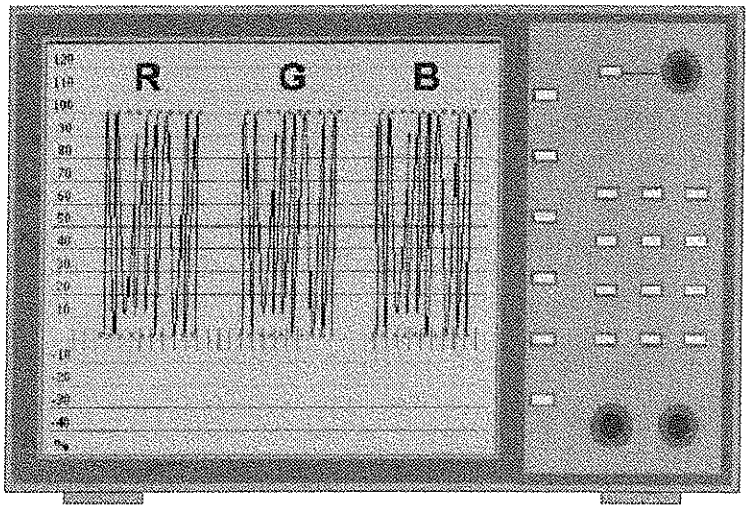


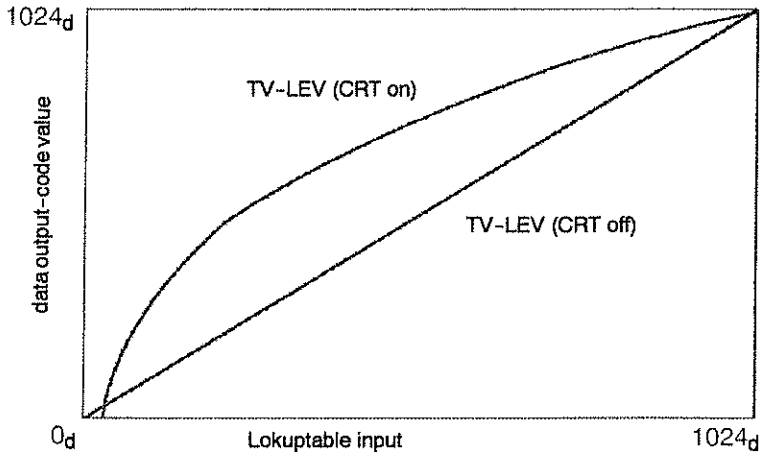
Fig. 413: WFM

TVLEV

"TVLEV" Image data maintains the TV video levels:

black level	$64_{d\ (10\ bit)}$
white level	$940_{d\ (10\ bit)}$
high lights	up to $1019_{d\ (10\ bit)}$

Characteristics:



Note!

The CRT gamma is normally switched **on**
- main menu "Color", submenu "Col Set"
- but may be switched **off** for pure linear video signals.

Description TV LEV

This lookup table maps the image data according to standard video levels (reference black and white) and provides highlight range beyond the reference levels.

This is the easiest way to transfer film content into data, as specially calibrated monitors are not required on the downstream workstations. Most applications can import data mapped to standard video level and visualize it correctly.

This transfer mode with CRT GAMMA ON is the best choice if final grading will be performed on Specter Virtual DataCine VDC.

To set up the telecine for transfers in TV LEV mode the colorist works the familiar way:

The DataCine is running in SDTV or HDTV video mode, color correction is done using the standard video monitor as a reference.

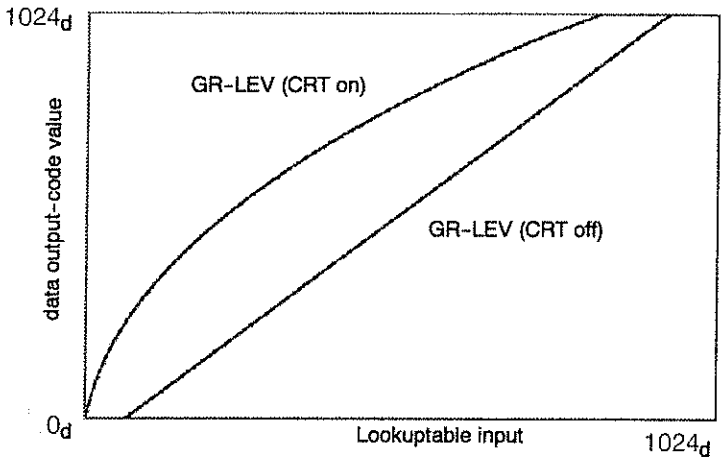
With the monitoring set to the output stage while still in video mode, it is worth noting that 0% (black) on the waveform monitor will be mapped to 64_d, and 100% (white) will be mapped to 940_d when the image data is transferred.

For any signal peaks above 100% there is a little headroom up to 1019d. The values between the black and white reference levels will be represented with a linear or CRT characteristic, depending on the CRT GAMMA setting on the film scanner.

GRLEV "GRLEV" Image data is mapped to graphic video levels

black level	0_d
white level	$1019_{d\ (10\ bit)}$
within a total range of	$0 - 1023_{d\ (10\ bit)}$

Characteristics:



Note!
The CRT gamma is normally switched **on**
- main menu "Color", submenu "Col Set"
- but may be switched **off** for pure linear video signals.

Description GRLEV

Graphics level behaves the same way as TV level, the only difference is the data mapping within the 10-bit range Looking at the output test point, 0% signal will be mapped to 0_d, 100% to 1019d. There is no headroom for signal portions above 100%.

In the past, traditional graphics workstations for print media (i.e. desktop publishing) usually worked in graphics level, they did not spend bits for headroom, which originates out of the video domain.
Only video oriented applications reserve some code values to provide headroom within their 8 or 10-bit environment to ensure that no picture information is clipped.

Attention!
Many applications can handle TV level and Graphics level data separately, therefore it is important to switch the application to the right mode in order to receive the data appropriately.
If you are working in the wrong way at this point, you will compress the data or cut off high and low lights.

The compression can be handled by the downstream application in most cases by setting the data to a higher contrast, but is not recommended for quality reasons.

Note!
The cutoff of information (data from telecine in graphics level, downstream application in TV level mode) cannot be restored.

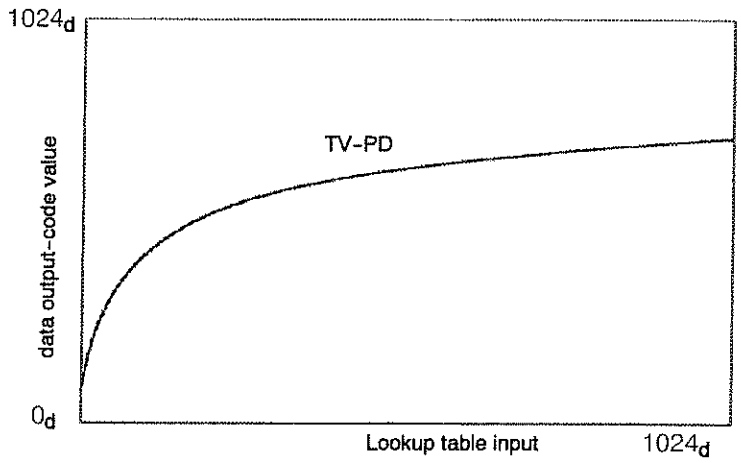
"TV-PD"

Image data, color graded on a TV monitor, are mapped to Printing Density characteristic for CINEON DXR files - e. g. used for post production systems like Inferno / Fire (Discreet Logic) or Domino (Quantel).

TV-PD lookup table transfers the dynamic range of the TV display into the logarithmic domain. No highlight details appear above ~ 720_d.

black level	95_d **(10 bit)**
white level	685_d **(10 bit)**
highlights	up to ~ 720_d

Characteristics:



Description TV-PD

To set up the machine for TV-PD, grade your film on your video monitor as usual, then switch to data mode, choose TV-PD as LUT and start the transfer.

The telecine monitoring test point has to be switched to Output stage.

0% (black) on the WFM will be mapped to 95_d,
94% (white) will be mapped to 685_d (658mV).

The transferred data will contain all information up to approx. 109% signal level at the waveform monitor.

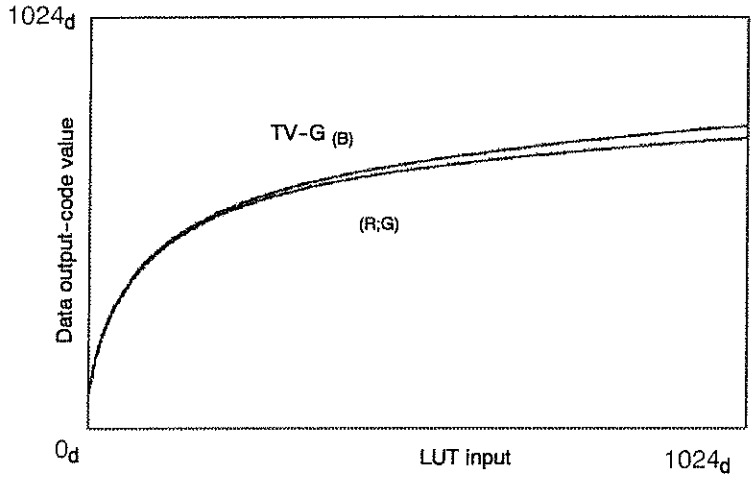
In TV-PD mode, CRT GAMMA (Menu Color - Col Set)cannot be deselected because it is part of the logarithmic TV-PD transfer characteristic.

Note!
The TV-PD in Specter always requires TV LEV data with CRT GAMMA switched "ON" at the telecine.

TV-G

"TV-G" Images, color graded on a TV monitor, are mapped to Printing Density characteristic for CINEON DXR files.
In addition to the TV_PD mode, the TV-G mode provides a closer color matching to the Kodak **Genesis** scanner.

black level	$95_{d\ (10bit)}$
white level	$685_{d\ (10bit)}$
highlights	up to~720_d



Note!
In mode "TV-G", the CRT gamma is not selectable, because CRT gamma is replaced by the TV-G transfer characteristic.

Description TV-G

TV-G is similar to TV-PD, the only difference is the Genesis scanner emulation, reproducing data the same way as if they were scanned on a Genesis scanner.

The code values (black, white and highlights) representing green and red signals are equal to TV-PD.

The code value mapping for blue is slightly higher towards the upper values to meet the output characteristic of the Genesis or Lightning scanner.

In TV-G mode, CRT GAMMA cannot be deselected because it is part of the TV-G transfer characteristic.

Note!
The TV-G data output on Specter always requires TV LEV data with CRT GAMMA switched ON at the telecine.

When transferring a greyscale pattern, light fields will not get colored on a Cineon calibrated monitor. A monitor that is calibrated for logarithmic code values from 95 to 685 will display colored gray fields.

DXR

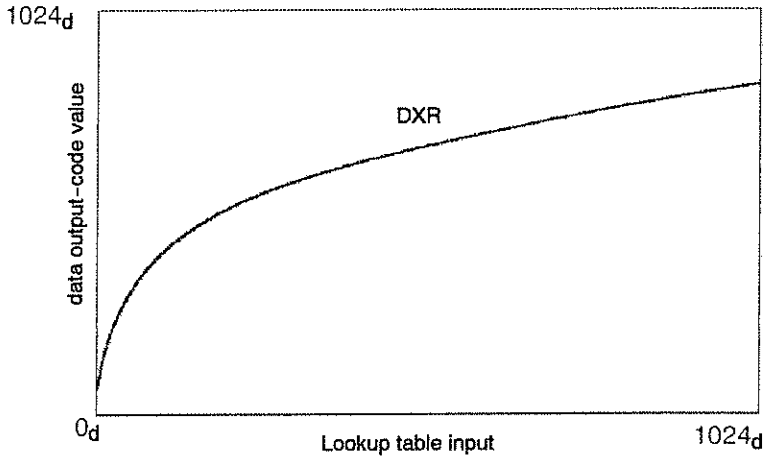
"DXR" Printing density characteristic for
CINEON DXR (Digital Extended Range) files

- e. g. used for post production systems like Inferno / Fire (Discreet Logic) or Domino (Quantel) -

which captures most of the dynamic range of NEG films.

black level	$95_{d\ (10\ bit)}$	(2% / 14 mV)
white level	$685_{d\ (10\ bit)}$	(79% / 554 mV)
highlights	up to 859_d	

Characteristics:



Description DXR

This lookup table maps image data logarithmically to a range according to Cineon DXR (Digital eXtended Range) specifications.

This format provides enough headroom to capture most of the dynamic range of negative film.
Actually a slightly greater range of highlight information is transfered than the video monitor can display.

In comparison to the TV-PD LUT (where only the information from the monitor is transfered - "IWYG is transfered") more highlight information is captured with the DXR-LUT.

The following procedure should be performed for one-light transfers for all kinds of material.

Setup Recommendations for DXR

OCN
(Original Color Negative) film material

D_{min} = lowest density D_{max} = highest density

For an **One-Light** transfer of **OCN** material, the following settings are recommended:

Set Film Type

- Set Film Type to "**Color Negative**" - main menu "**Film**", submenu "**Matching**"

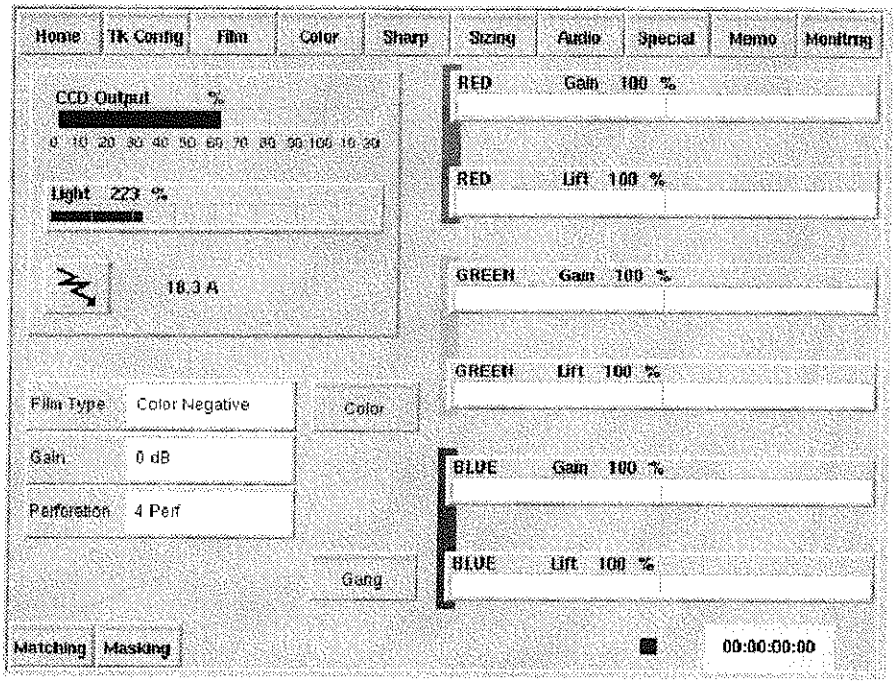


Fig. 414: Main menu **"Film"** / submenu **"Matching"**

Set Unity

- Set primary color correction (Grading) to "**unity -this page**" - main menu "**Color**", submenu "**Primary**"

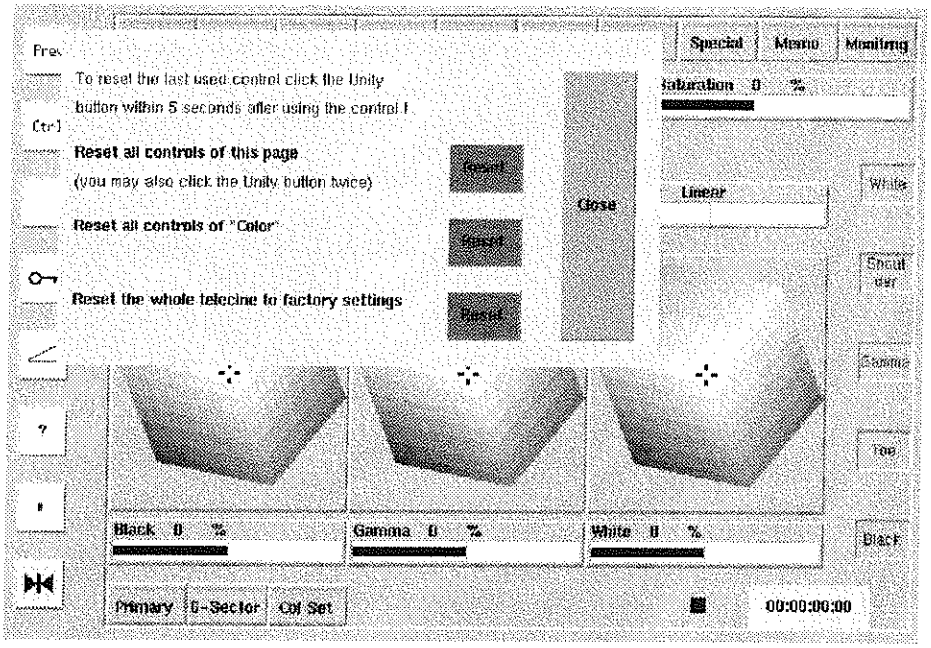


Fig. 415: Main menu **"Color"** submenu Primary and **"Unity" button**

Select Testpoint AIH / FPN

- Set the testpoint selector to testpoint **"AIH/FPN"**
  - main menu **"Monitoring"**, submenu **"Test Pnt"**

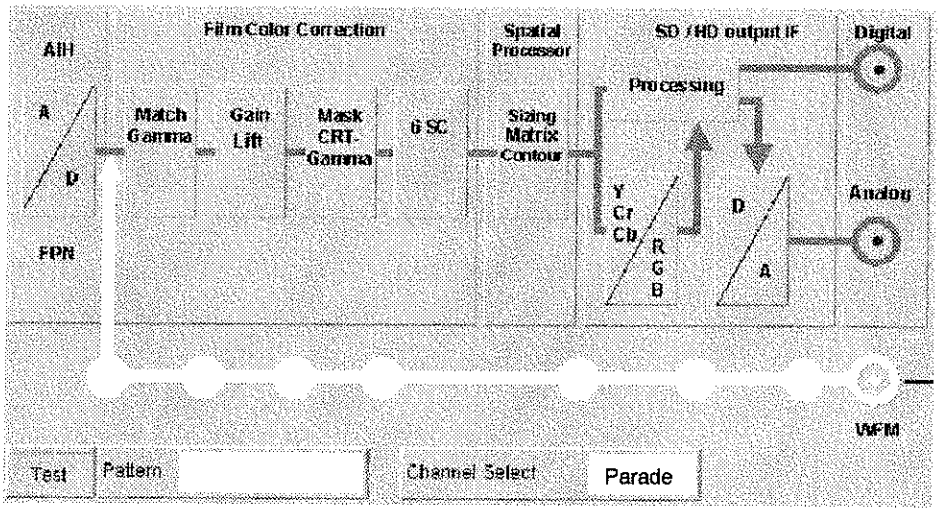


Fig. 416: Main menu **"Monitoring"** / submenu **"Test Pnt"**

Set Illumination

- Select main menu "Film", submenu "Matching"
- Select "Play" mode with running NEG film
- Adjust the minimum density (white field, e.g. frame bar) of the NEG film to ≦ 100%. Use Light control!

  Note!

  The scanned image signal of the negative film is not inverted at testpoint AIH/FPN, that means the frame bar produces peak white (D_{min})!

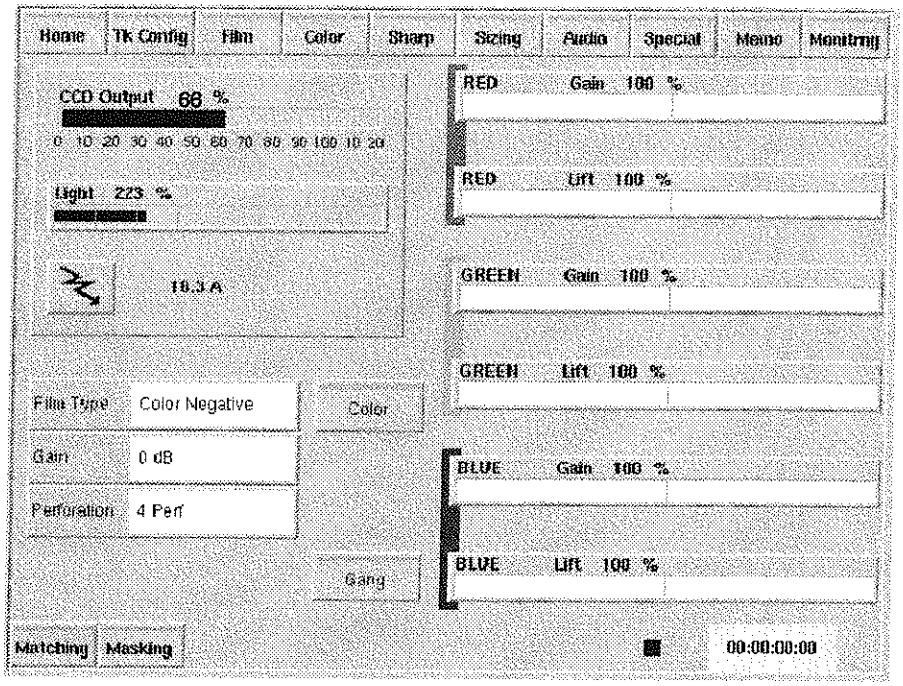


Fig. 417: Main menu **"Film"** / submenu **"Matching"**

Adjust Light (illumination) until the signal level on the wave form monitor does not exceed 100 %.

Select Testpoint

Mask CRT Gamma

- Select main menu **"Monitoring"**, submenu **"Test Pnt"**
- Set the testpoint selector to testpoint "Film Color Correction / Mask CRT-Gamma".
  Note!
  From this testpoint, the video signal of the Neg Film is inverted and produces black at the frame bar.

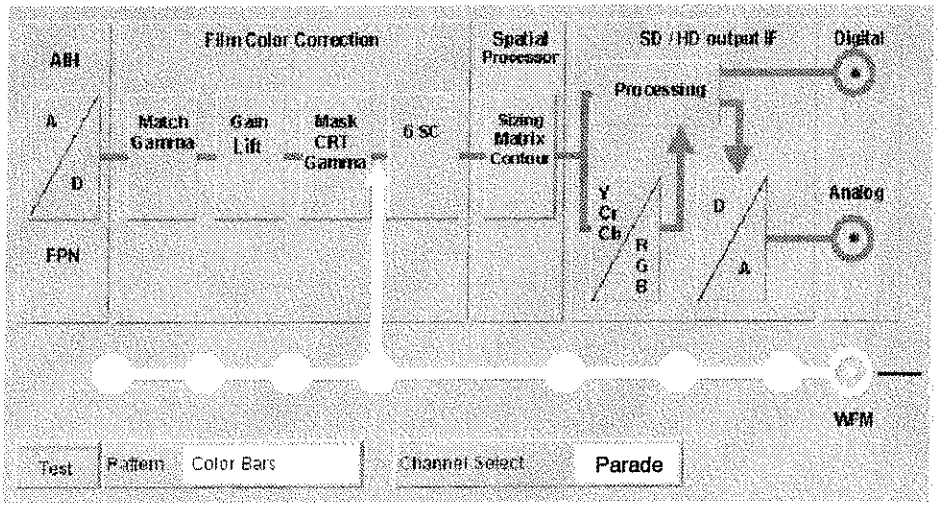


Fig. 418: Main menu **"Monitoring"** / submenu **"Test Pnt"**

Preset Lift & Gain DXR

- Select main menu **"Film"** / submenu **"Matching"**.
  As a starting point, set Matching "Gain" controls of the GCP in all three channels to 80% and Matching "Lift" controls to 180%.

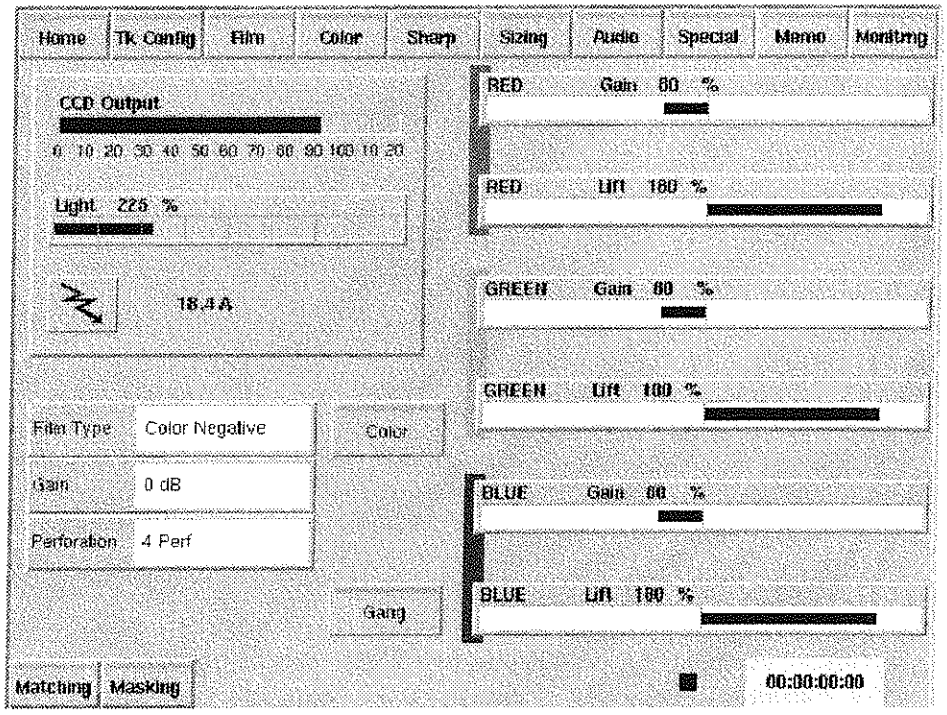


Fig. 419: Film menu, matching lift & gain

Set Reference White DXR

- Adjust peak white (maximum density D_{max} on NEG film) **for all three channels** to video level **554 mV** (WFM) just below clipping with Matching "Gain" controls.

Set Reference Black DXR

- Adjust "Matching Lift" (black) controls in **all three channels** to **14mV** (WFM).

- Repeat Gain and Lift adjustments until the levels for reference white and black are reached at the same time.

Note!

a) In DXR mode, the CRT gamma is not selectable, because CRT gamma is replaced by the DXR transfer characteristic.

b) Image monitoring requires a logarithmic calibrated graphics display monitor.

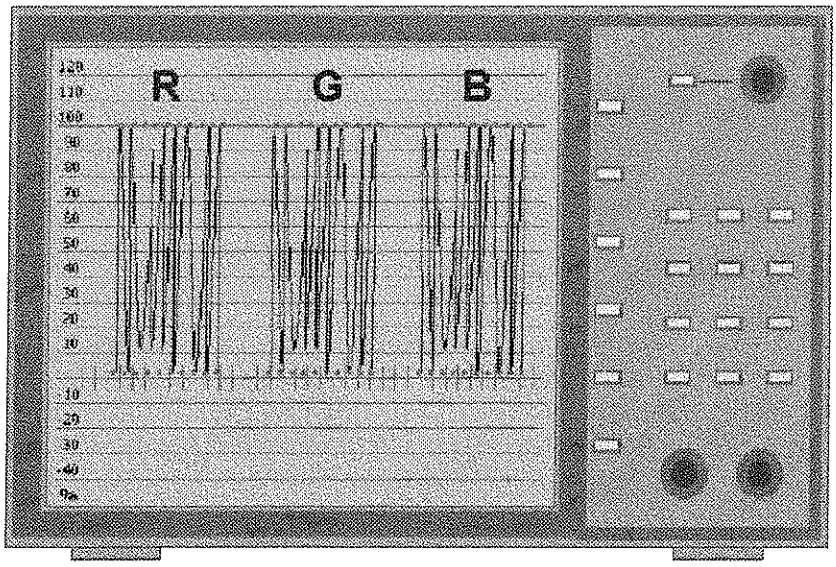
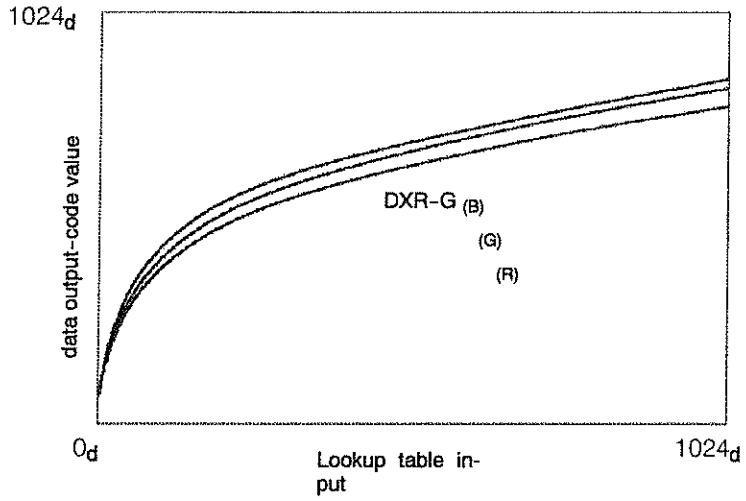


Fig. 420: RGB level setup for transfers with DXR characteristic

DXR_G "DXR-G" Printing density characteristic for CINEON DXR files, which captures the dynamic range of NEG films. In addition to the DXR mode, the DXR-G mode provides a closer color matching to the Kodak **Genesis** scanner.

black level	95_d	(2% / 14 mV)
white level	685_d	(79% / 554 mV)
highlight	up to 859_d	



Description DXR-G

The DXR-G lookup table is the equivalent to the DXR LUT the same way as TV-PD and TV-G.

Image data are mapped to printing density characteristics according to Cineon DXR specifications.

The telecine setup should be performed similarly as described for DXR LUT, but with the following differences:

1. First adjust (Lift) black and (Gain) white in the G-channel as described for DXR.
2. Adjust matching Lift (black) readings for R- and B-channel to the control value of the G-channel.
3. Adjust the black level for R- and B-channel with Matching Gain to 2%. If the peak white level in one channel should be clipped, please take this channel as a reference for the first Matching Black and Gain adjustment instead of G-channel.

Setup Recommendations for DXR-G

OCN film material

For an **One-Light** transfer of **OCN** (Original Color Negative) material, the following settings are recommended:

Note!
The DXR-G lookup table is the equivalent to the DXR LUT.
Image data are mapped to printing density characteristics according to Cineon DXR specifications.

The telecine setup should be performed similarly as described for DXR LUT:

Set Film Type

- Set Film Type to **"Color Negative"**
  - main menu **"Film"**, submenu **"Matching"**

Set Unity

- Set primary color correction (Grading) to **"unity -this page"**
  - main menu **"Color"**, submenu **"Primary"**

Select Testpoint AIH / FPN

- Set the testpoint selector to testpoint "AIH/FPN"
  - main menu "Monitoring", submenu "Test Pnt"

Set Illumination

- Select main menu Film, submenu Matching
  Adjust the minimum density (white field, e.g. frame bar) of the NEG film to ≦ 100%. Use Light control!

  Note!
  The scanned image signal of the negative film is not inverted at testpoint AIH/FPN, that means the frame bar produces peak white (D_{min})!

Select TP Mask / CRT Gamma

- Set the testpoint selector to testpoint "Film Color Correction / Mask CRT-Gamma". - main menu **"Monitoring"**, submenu **"Test Pnt"**

  Note!
  From this testpoint, the signal of the Neg Film is inverted and produces black at the frame bar.

Set Reference White G-Channel

- Adjust peak **white** (maximum density D_{max} on NEG film) of the **G-channel** to **554 mV** at wave form monitor just below clipping with "Green Gain" control.

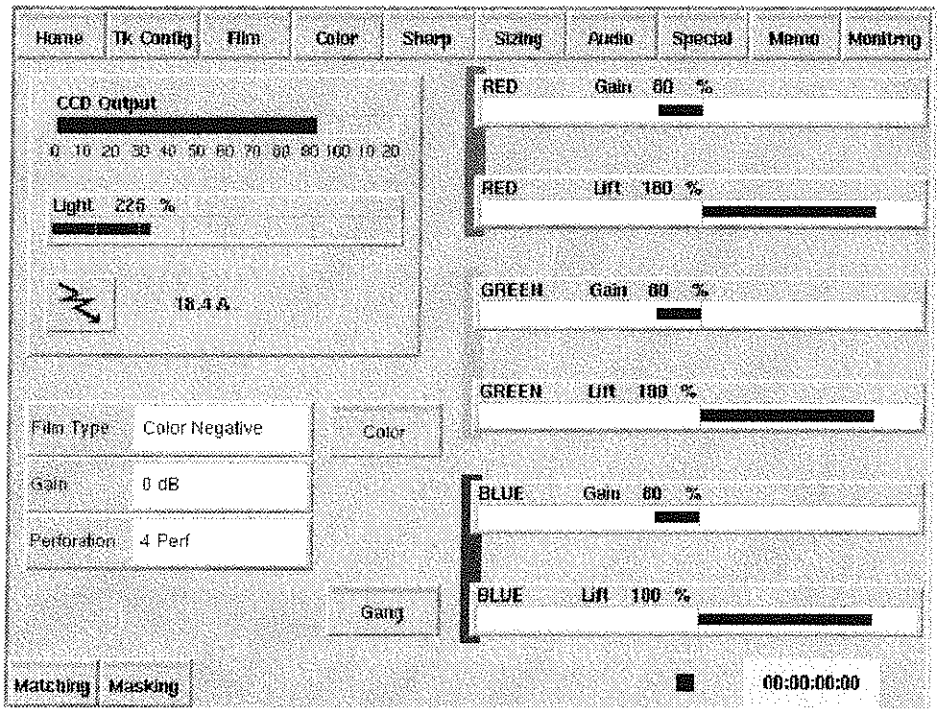


Fig. 421: Film menu, matching lift & gain

Set Reference Black G-Channel

- Adjust "Green Lift" (black) control of the **G- channels** to **14mV** at the WFM.

- Repeat Gain and Lift adjustments of the G-channel until the levels for reference white and black is reached.

Set R & B Lift Controls

- Adjust the "Red & Blue Lift" (black) " controls for **R- and B-channels** to the control value of the G-channel.

Set Reference Black & White R- & B-Channel

- Adjust the black levels for **R- and B-channels** with "Matching Gain" to 14 mV.

  If the peak white level in one channel should be clipped, please take this channel as a reference for the first "matching lift (black)" and "matching gain" adjustment instead of the G-channel.

Note!

c) In DXR-G mode, the CRT gamma is not selectable, because CRT gamma is replaced by the DXR-G transfer characteristic.

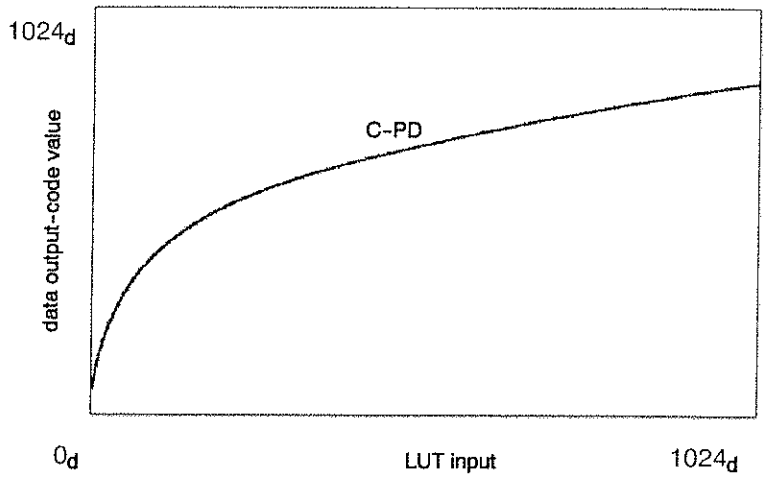
d) Image monitoring requires a calibrated graphics display monitor.

"C-PD" Cineon Print Density

This logarithmic characteristic is close to the mathematical Printing Density characteristic. The density range is from 0 to 2.0.

black level	95_d (10 bit) (3.5% / 24.5 mV)
white level	685_d (10 bit) (71% / 497 mV)
highlights	up to 1019_d

Characteristics:



Note!
In mode "C-PD", the CRT gamma is not selectable, because CRT gamma is replaced by the C-PD transfer characteristic (Menu Grading -Grading Setup).

Description C- PD

With the C-PD LUT, the film information will be transferred into a DPX Cineon file containing the black and white information as other logarithmic transfers, but highlight information is covered up to code value 1019_d.

In C-PD mode, the internal monitoring processing is different from other LUTs, therefore the waveform monitor display is different. See the difference when switching between VIDEO and DATA MODE in C-PD.

To set up the telecine for C-PD LUT, you can either use the original film material if you have an indication of reference black and white (90% reflectance) or take a TAF film printed on the same material.

The figure below shows a typical data transfer application with "C-PD" data conversion mode.

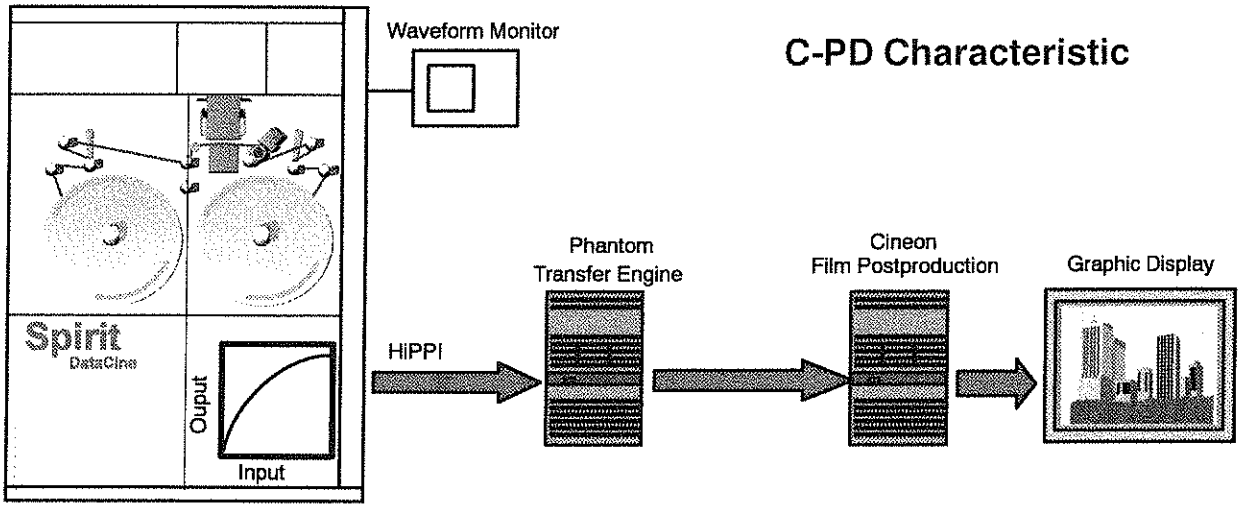


Fig. 422:

- Connect a waveform monitor to the monitoring outputs of Spirit DataCine - Rack 2

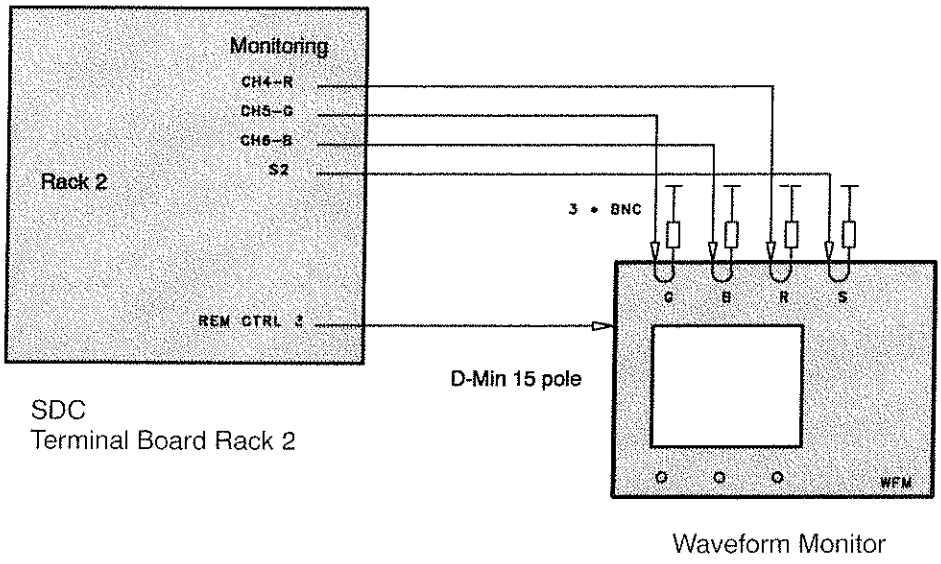


Fig. 423:

C-PD setup Recommendations

For logarithmically or Cineon calibrated Monitors!

For an **One-Light** transfer of **OCN** (Original Color Negative) material, the following settings are recommended:

Important!

To setup the DataCine for CPD transfers, the machine has to be switched into Data mode, C-PD LUT 50 Hz or 59.93 Hz.

Set Data mode & C-PD LUT

- Select main menu "TK Config", submenu "Data"
- Set the film scanner to Data mode 50 or 59.93
- Select C-PD LUT

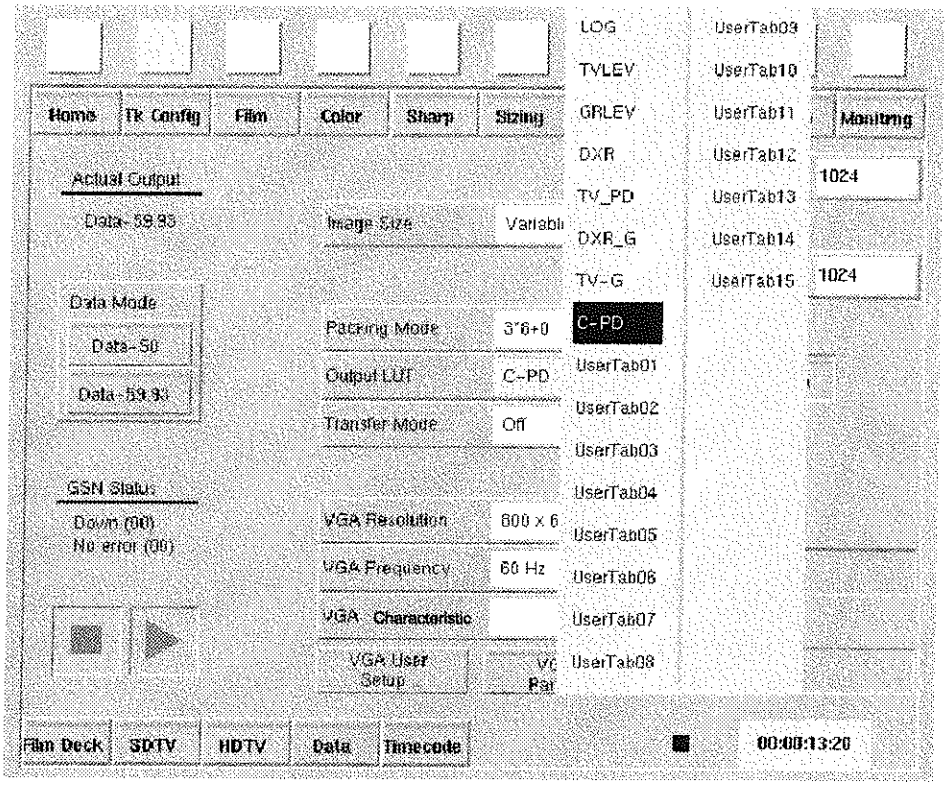


Fig. 424: Main menu **"Tk Config"** / submenu **"Data"**, pulldown menu **"Output LUT"**

Set Film Type

- Set Film Type to **"Color Negative"** - main menu **"Film"**, submenu **"Matching"**

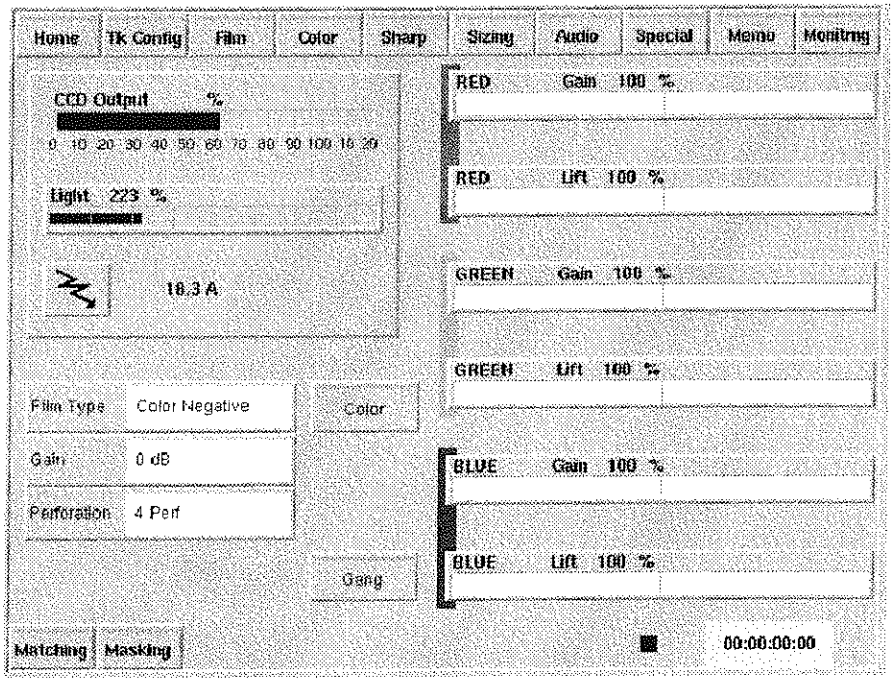


Fig. 425: Main menu **"Film"** / submenu **"Matching"**

Set Unity

- Set primary color correction (Grading) to **"unity -this page"** - main menu **"Color"**, submenu **"Primary"**

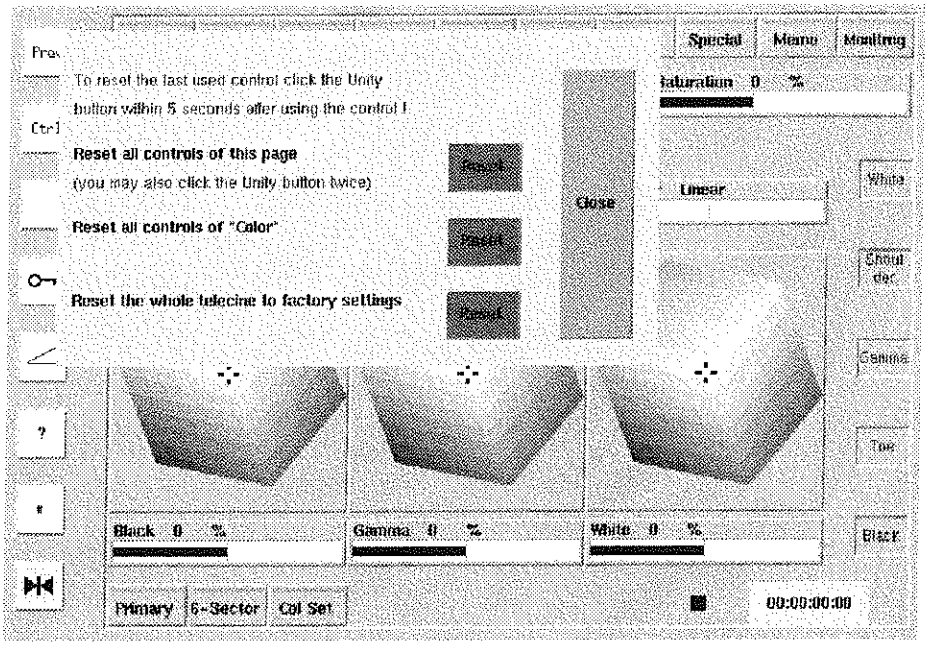


Fig. 426: Main menu **"Color"** submenu Primary and **"Unity" button**

Select Testpoint AIH / FPN

- Set the testpoint selector to testpoint "**AIH/FPN**"
  - main menu "**Monitoring**", submenu "**Test Pnt**"

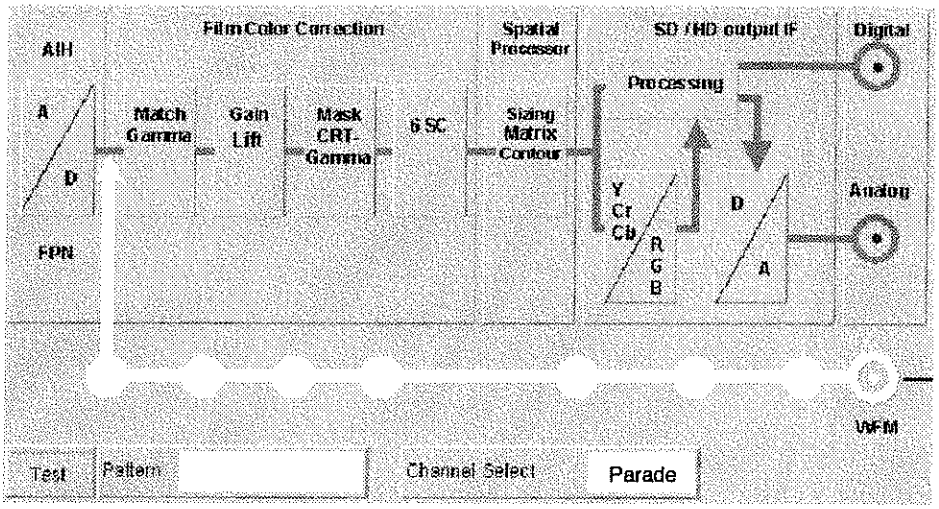


Fig. 427: Main menu **"Monitoring"** / submenu **"Test Pnt"**

Set Illumination

- Adjust the minimum density (white field, e.g. frame bar) of the NEG film to ≦ 100%. Use Light control!

Note!
The scanned image signal of the negative film is not inverted at testpoint AIH/FPN, that means the frame bar produces peak white (D_{min})!

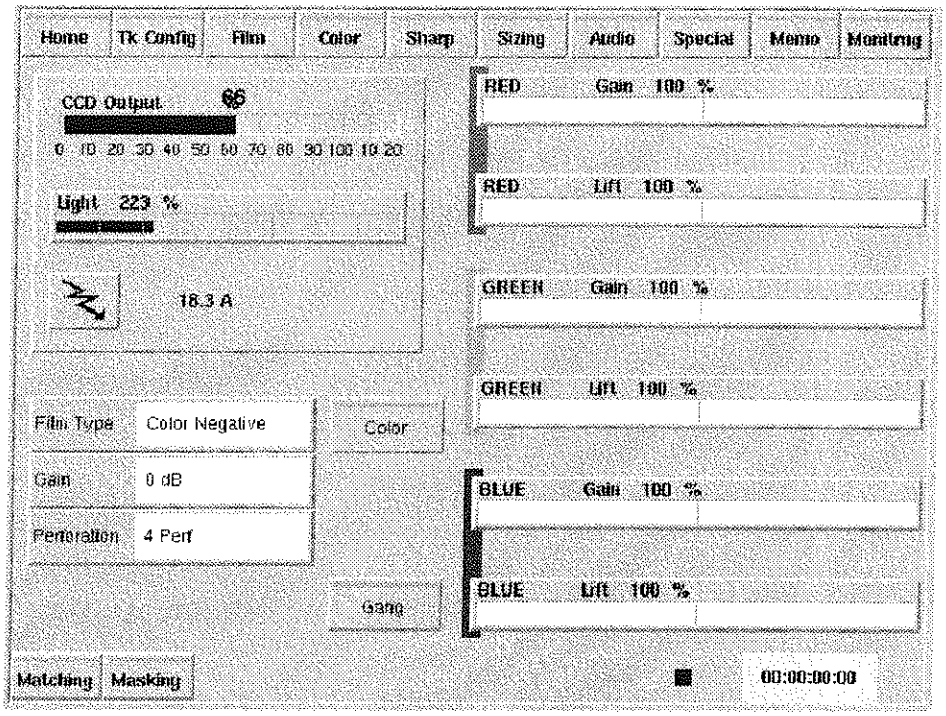


Fig. 428: Main menu **"Film"** / submenu **"Matching"**

- Adjust Light (illumination) until the signal level on the wave form monitor does not exceed 100 %.
  If the peak signal values differ very much, film type "**Intermediate Neg**" may give a better match.

Select Test Point Mask / CRT Gamma

- Set the testpoint selector to testpoint "Film Color Correction / Mask CRT-Gamma". - main menu **"Monitoring"**, submenu **"Test Pnt"**
  Note! From this testpoint, the signal of the Neg Film is inverted and produces black at the frame bar.

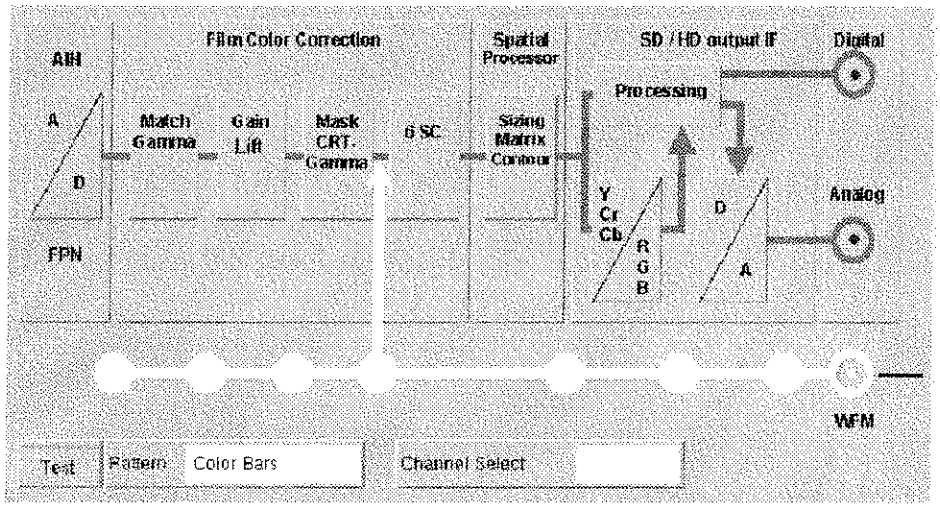


Fig. 429: Main menu **"Monitoring"** / submenu **"Test Pnt"**

For logarithmic calibrated Monitors

- Set Matching as follows for **all three channels**

  496 mV at WFM for white (use R - G - B - Gain controls)
  23 mV at WFM for black (use R - G - B - Lift controls)

  Repeat Gain and Lift adjustments until the levels for reference white and black are reached at the same time.

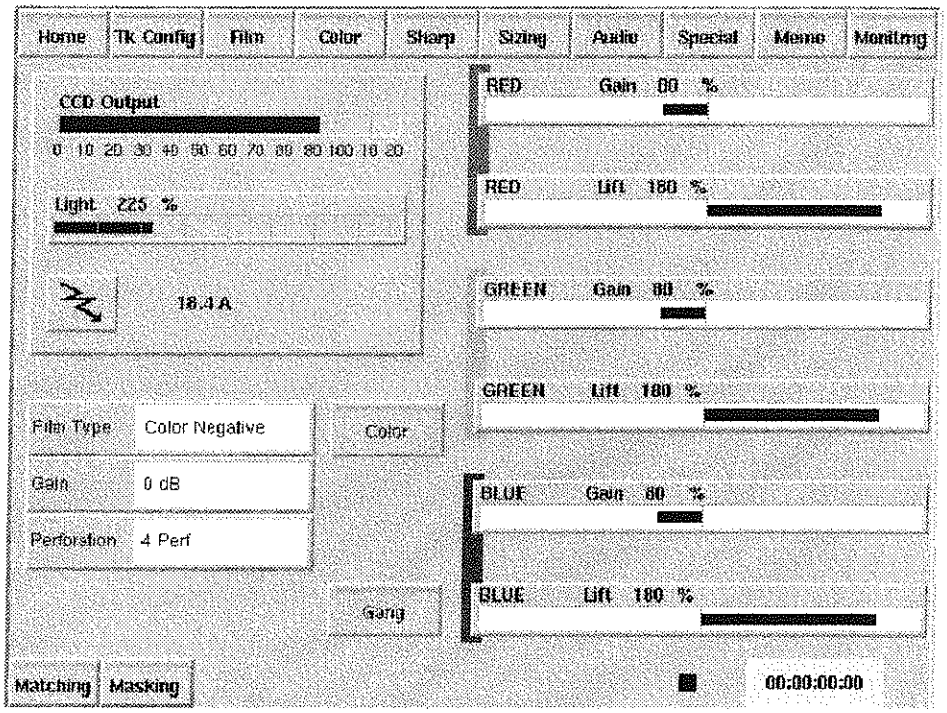


Fig. 430: Film menu, matching lift & gain

For Cineon calibrated monitor

- Set Matching as follows for **the channel with the largest dynamic range**.

  496 mV for white (use Gain controls)

  23 mV for black (use Lift controls)

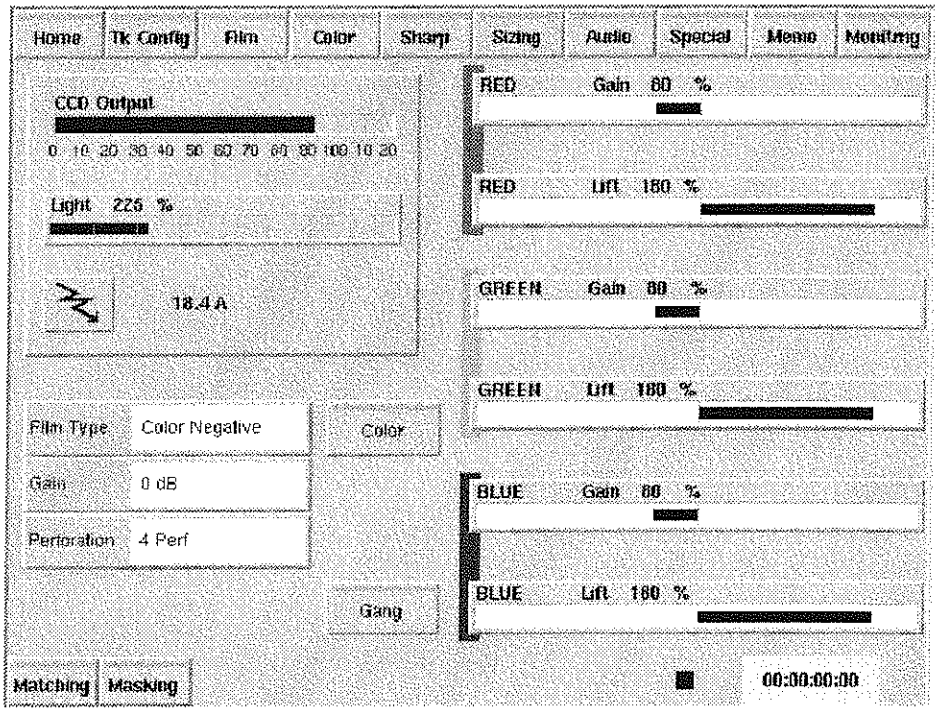


Fig. 431: Film menu, matching lift & gain

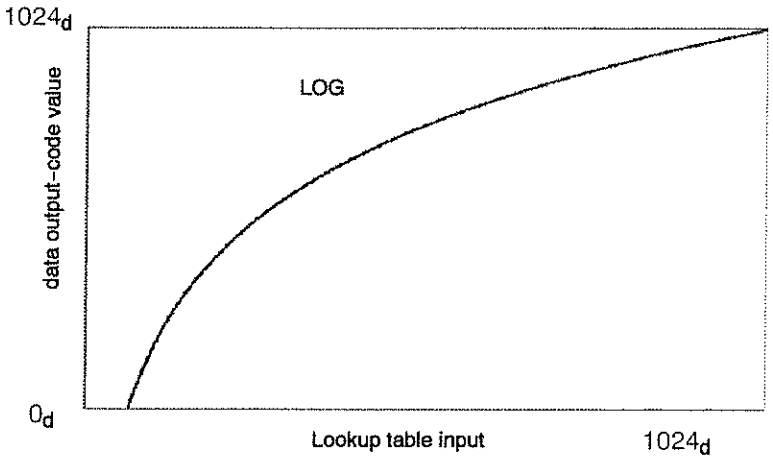
- Set the other two channels to the matching lift control value of the channel above, independent of the level values of the WFM.

- Adjust the black level of these two channels with "Matching Gain" to 23mV at WFM.

LOG

"LOG" "LOG" characteristic for CINEON DXR files.

black level	95_d
white level	685_d
highlight	1019_d



Note!

This lookup table maps the image data to obtain a logarithmic transfer characteristic from a linear signal without applying CRT Gamma.

This LUT is **not recommended** any more to be used on the Spirit DataCine as it was replaced by the better suited C-PD lookup table.

UserTab01

"User Tab 01 - 15" Allows to use customer specified lookup tables.

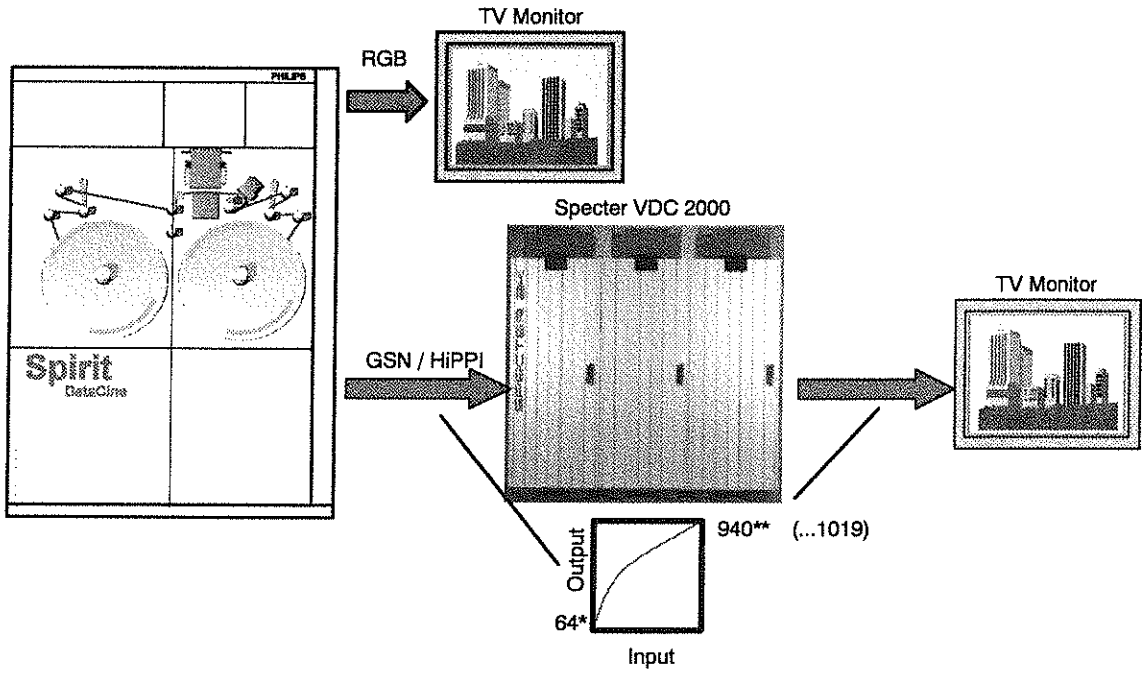
To generate and perform a download of LUT to the data output board of the Spirit DataCine see the detailed description of the separate SDCMAINT Manual FU 0058 provided in the supplement of this manual

Application	Settings		Characteristics			Workstation Requirements	Comment
	CRT	DATA	Function	Ref Black (10bit)	Ref White (10bit)		
Grading on a TV Monitor TV => DATA => TV	ON	TVLEV	TV-Gamma	64d	940d	no import or export LUTs ! display gamma = 1 (or fine tuned)	transparent => black and white unclipped
	ON	GRLEV	TV-Gamma	0d	1019d	TV export LUT display gamma = 1 (or fine tuned)	black and white clipped
TV => DATA =>FILM	ON	TVLEV	TV-Gamma	64d	940d	import LUT to 0...1023 and >10 bit linear display gamma to be applied	Workstation clips black and white
	ON	GRLEV	TV-Gamma	0d	1019d	import LUT to >10 bit linear display gamma to be applied	black and white clipped
	-	TV-PD	Print Density	~ 95d	~ 685d	Cineon or Cineon import LUT log. calibrated Monitor	Cineon Printing Densities for e.g. Inferno, Fire, Domino,
	-	TV-G	Genesis PD	~ 95d	~ 685d	Cineon system Cineon calibrated Monitor	Cineon Printing Densities for Genesis emulation
Grading on a calibrated Graphics Display FILM=>DATA=>FILM	-	DXR	Print Density	~ 95d	~ 685d	Cineon import LUT Logarithmic cal. Monitor	Cineon Printing Densities for e.g. Inferno, Fire, Domino; One-Light **OCN** transfer with - primary color corr. = UNITY - illumin. signal level ≤100% - matching Black control / RGB = 14mV WFM* - matching Gain control / RGB = 554 mV WFM *
	-	DXR-G	Genesis PD	~ 95d	~ 685d	Cineon system Cineon calibr. Monitor	Cineon Printing Densities for Genesis emulation One-Light **OCN** transfer with -primary color corr. = UNITY - illumin.: signal level =100% - matching Black control / RGB = 14 mV WFM* - matching Gain control RGB = 554 mV WFM*
	-	C-PD	Cineon Print D	~ 95d	~ 685d	Cineon import LUT Logarithmic cal. Monitor	Cineon Printing Densities - set Data mode first - set C-PD LUT - illumin. signal level ≤ 100% - matching Black 23mV & Gain 496 mV WFM
		C-PD	Cineon Print D	~ 95d	~ 685d	Cineon import LUT Cineon calibr. Monitor	see above C-PD comments. Match to channel with largest dynamic range.
	OFF	LOG	logarith-mic	~ 95d	~ 685d	special log. display LUT or import LUT	Cineon additional markers on the WFM for the black and white reference required
DATA, 8...10 bit linear	OFF	GRLEV	linear	0d	1019d	display gamma to be applied	black and white clipped

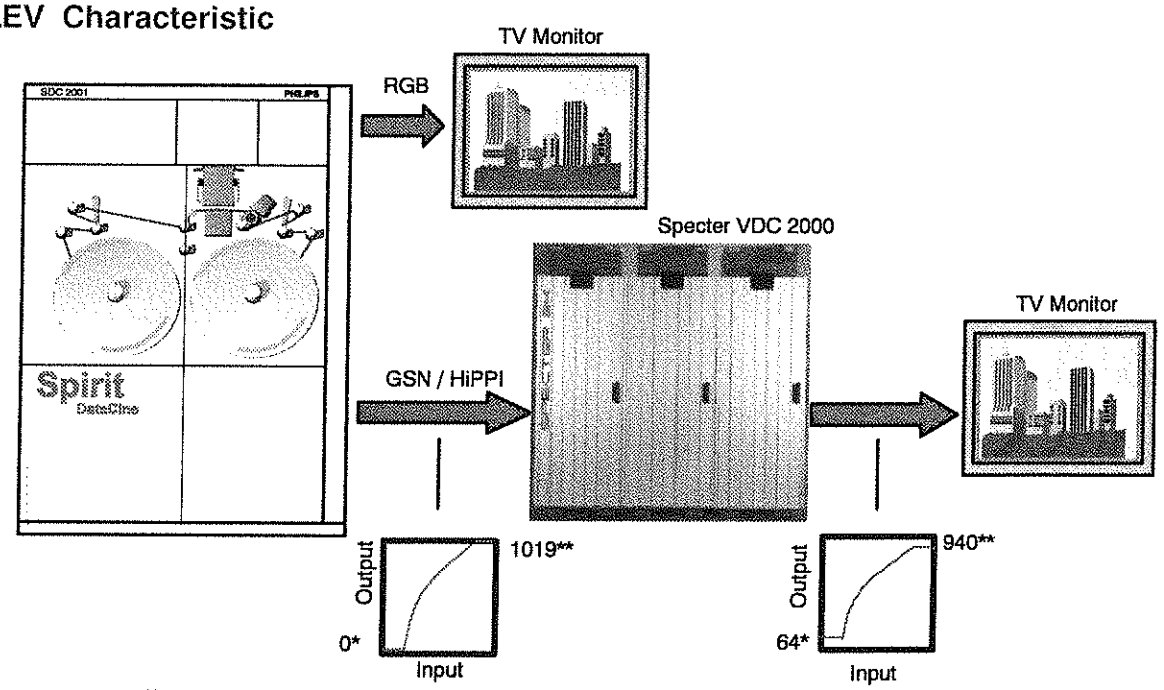
Fig. 432: Overview of Look-up tables (LUT) for data applications
* = Reference values at WFM (Wave Form Monitor). For fine adjustment, see description above "data conversion DXR or DXR_G"

Function of Look-up Tables for Data Applications / Data for TV

TVLEV Characteristic



GRLEV Characteristic

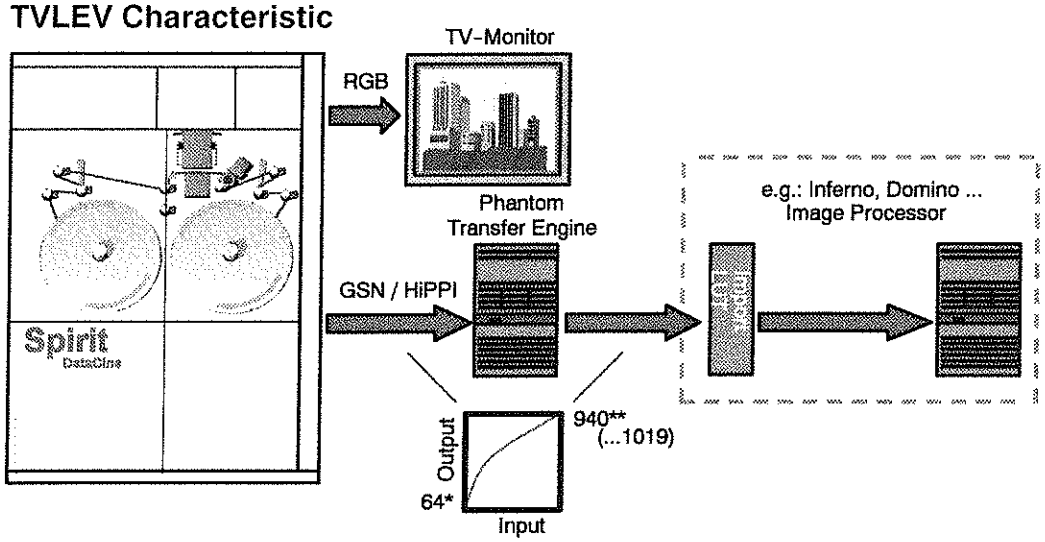


** White reference level : decimal value of a 10 bit system
* Black reference level : decimal value of a 10 bit system

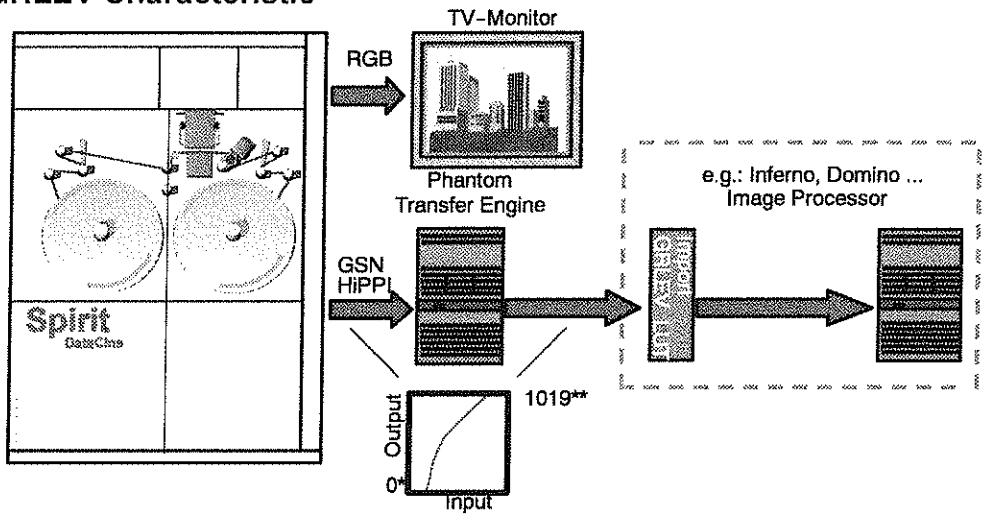
Fig. 433: Data conversion for TV

Function of Look-up Tables for Data Applications / Data for Film

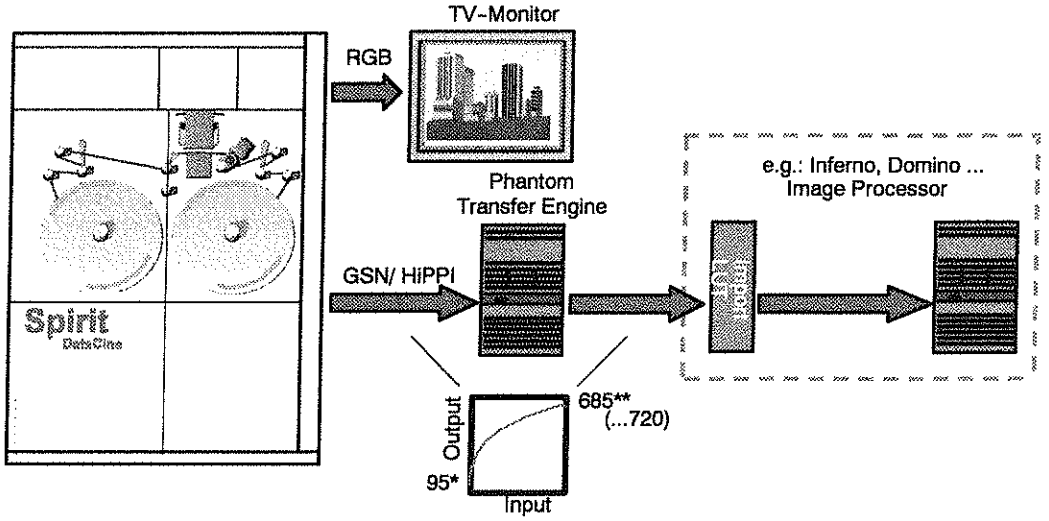
1. TVLEV Characteristic



2. GRLEV Characteristic

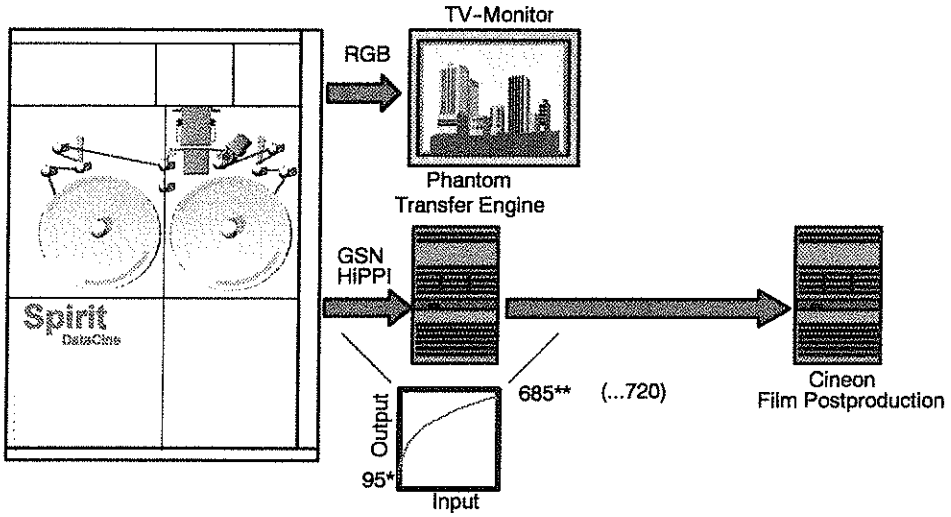


3. TV-PD Characteristic

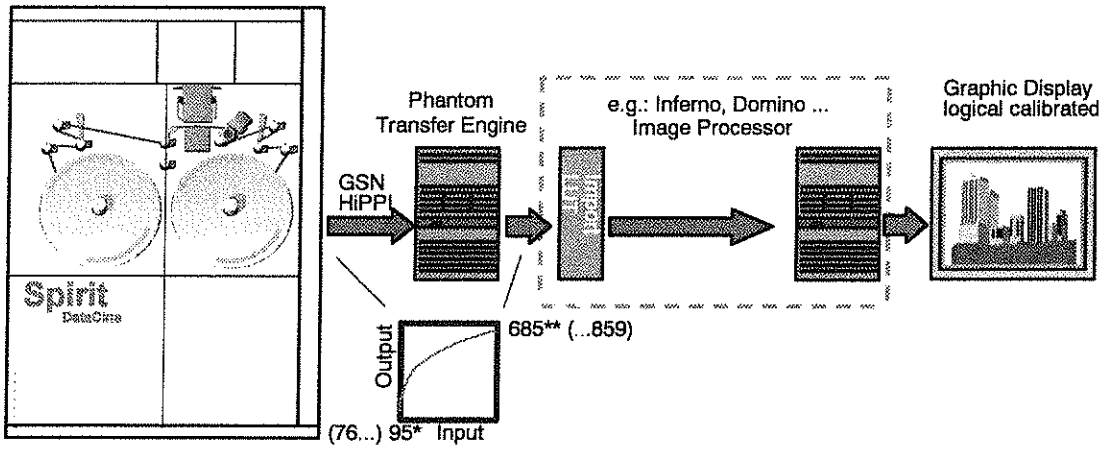


Function of Look-up Tables for Data Applications / Data for Film - Part II

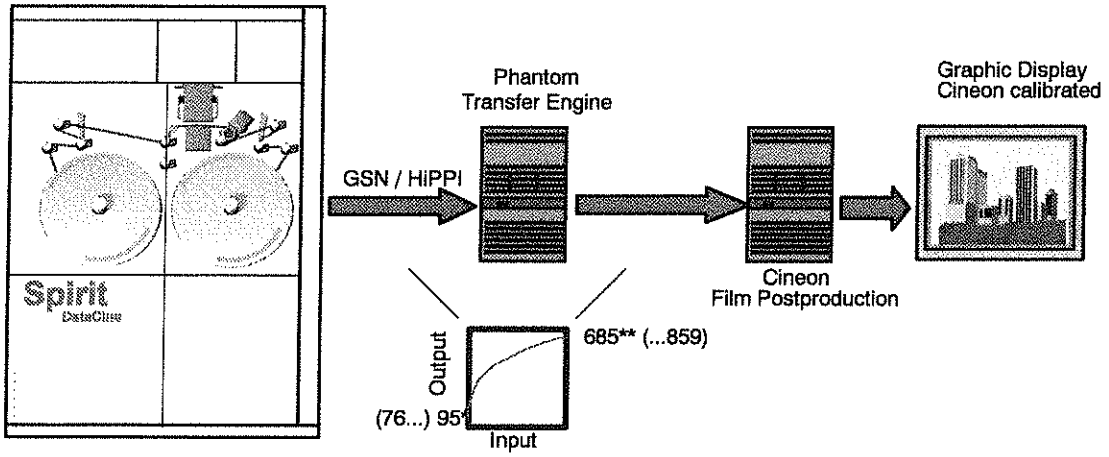
4. TV-G Characteristic



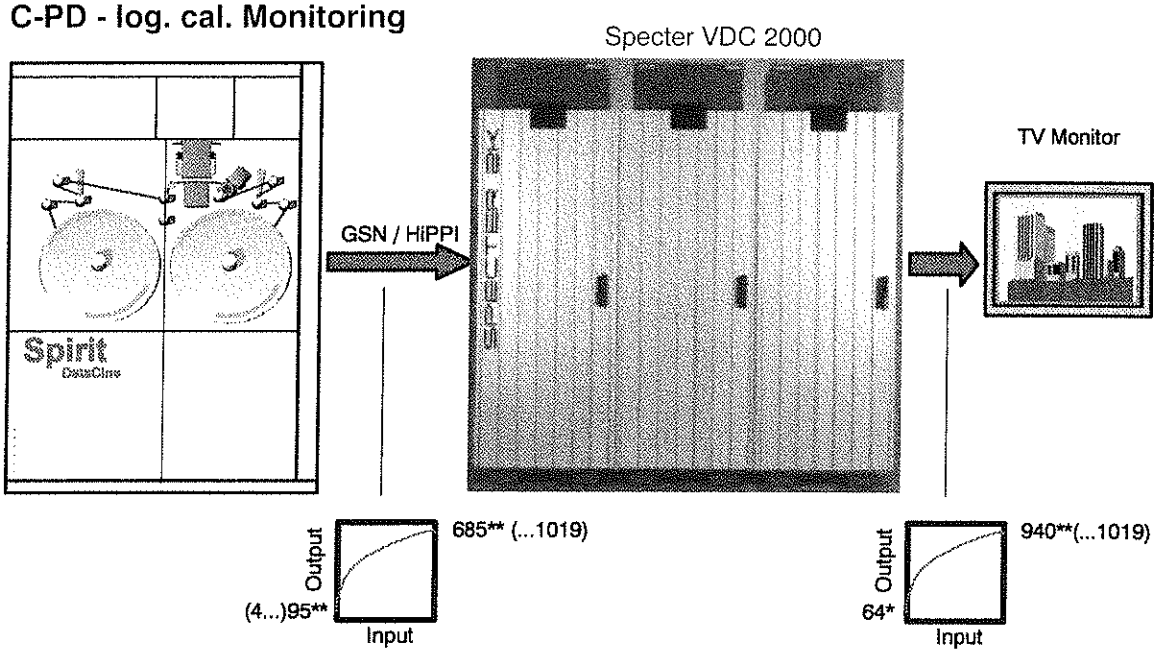
5. DXR Characteristic



6. DXR-G Characteristic



7. C-PD - log. cal. Monitoring



8. C-PD, Cineon cal. Monitoring

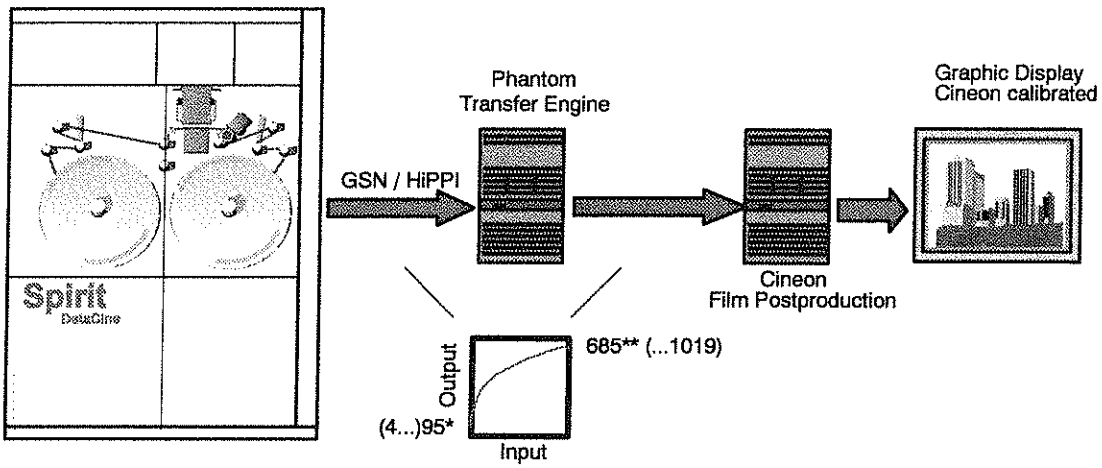
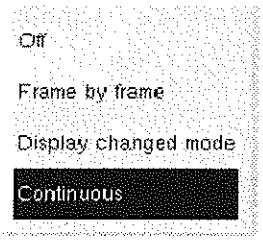


Fig. 434: Data application: Data for Film

8. Transfer Mode

Defines the transfer mode.



Selection: **Off** / frame by frame / display changed mode / continuous

"Off" No data transfer.

"Frame by Frame" **Only during PLAY** the data transfer begins by pressing transfer START and ends by pressing F2 transfer STOP.
Scanned images are transferred proportionally to the film speed.
Each frame is transferred **only once**.
The transmission is interrupted by STOP, if the external receiver is not fast enough.
This mode ensures that no image is missing in the transferred sequence.
Application: transferring and storing of **complete** sequences.

"Display changed mode" Data is transferred only if the film frame number or the image contents has changed.
The transmission **skips images**, if the external receiver is not fast enough.
Works in all operating modes (shuttle, step and so on).
Application: preview purposes

"Continuous" Continuous data transfer, independent of the film run status (test mode).

9. CRT Gamma

CRT is a gamma function to compensate the display gamma of a picture monitor.

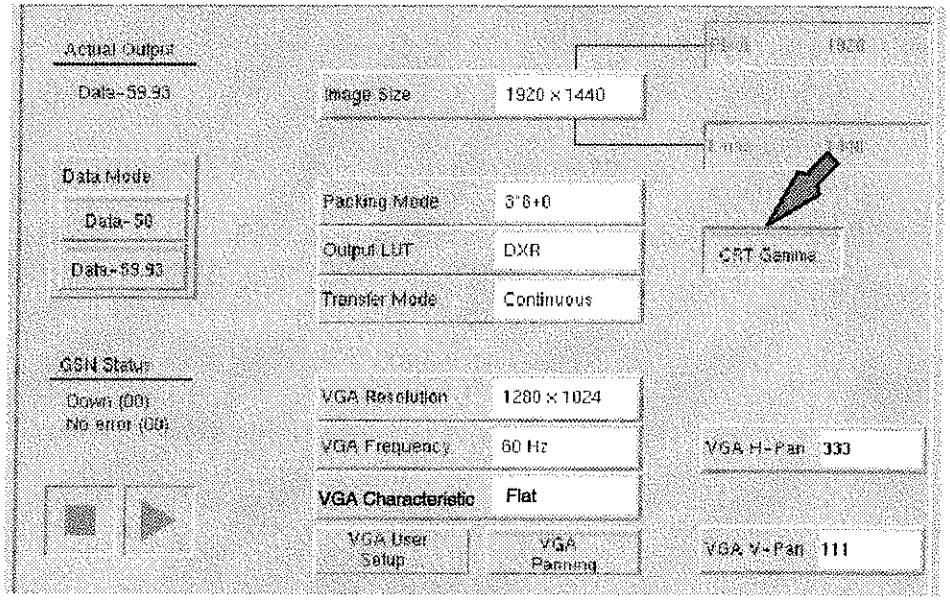
In order to judge a picture content (in terms of gradation) by looking at a monitor, CRT has to be switched on.

When working with Data, the end product is not necessarily video or a TV picture but a picture recorded back on film or a picture which will be projected by a video beamer. In this case, a Output LUT (lookup table) will be chosen that replaces the CRT gamma by its own characteristic.

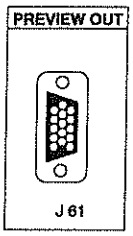
Depending on the selected Output LUT, CRT GAMMA will automatically be switched on or off.

Note! CRT GAMMA in Data mode is only active with TVLEV and GRLEV.

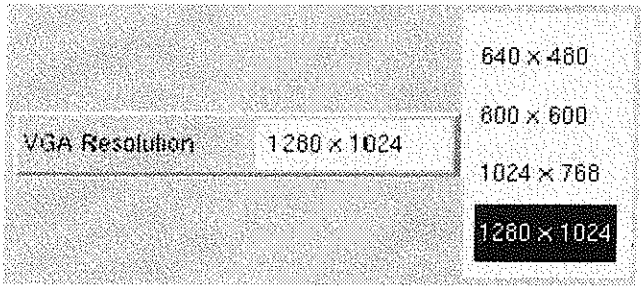
When CRT Gamma is active, the green bar on the button is lit.



10. VGA Resolution



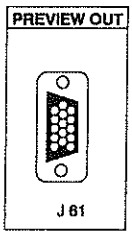
VGA Resolution serves to adjust the horizontal & vertical pixel resolution of the VGA Monitor connected to the Rack 3 socket J61 "Preview Out"

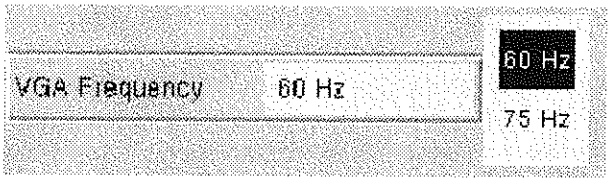


Selection: **640 x 480** / 800 x 600 / 1024 x 768 / 1280 x 1024

640 x 480	Hor 604 pixels - Vert 480 lines	(VGA)
800 x 600	Hor 800 pixels - Vert 600 lines	(SVGA)
1024 x 768	Hor 1024 pixels - Vert 768 lines	(XGA)
1280 x 1024	Hor 1280 pixels - Vert 1024 lines	(SxGA)

11. VGA Frequency

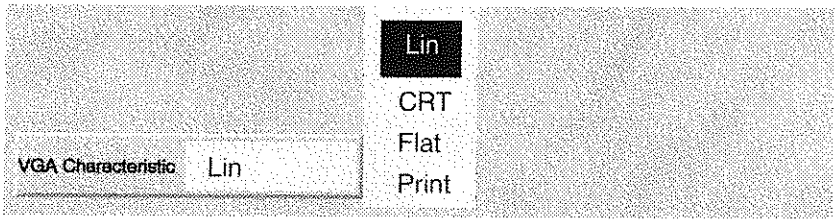




VGA Frequency serves to adjust the vertical frequence of the VGA Monitor connected to the Rack 3 socket J61 "Preview Out"

Selection: **60 Hz** / 75 Hz

12. VGA Characteristic



In dependency of the selected Data Output LUT and CRT gamma (on/off) color grading selection different display modes can be selected.

Selection: **Lin,** CRT, Flat, Print

A detailed description is provided in section "13.4 VGA Characteristic"on page LEERER MERKER

This function is redundant in the VGA User Setup window.

13. VGA User Setup

The option GSN data interface includes an additional VGA Interface which can be used for monitoring purposes.

The characteristic of the VGA video signal can be adjusted according to the transfer characteristic at the Data Output.

The processing at the preview monitoring output (VGA User Setup) is split into three processing blocks: VGA Pre-Processing, VGA Matrix, VGA LUT (see Fig. 46). The input to the VGA LUT depends on the Output LUT and VGA Characteristic selected. The characteristic for the preset Output LUTs is described in table LEERER MERKER on page LEERER MERKER.

Attention!
The adjustment of the monitor color temperature is done with the VGA LUT button, see item 13 in this chapter, details see also Fig. 435: on page 4-67.
Pressing "**VGA User Setup**" button opens a window for setting matrix coefficients and VGA LUTs.

GSN Data Output

Overview of Output LUT; CRT Gamma, VGA Characteristic, VGA LUT & Masking Controls

Menu TK Config

Submenu Data - VGA Setup -

12. / 13.4 VGA Characteristic:

Lin, CRT, Flat or **Print**

Submenu Data -VGA Setup -

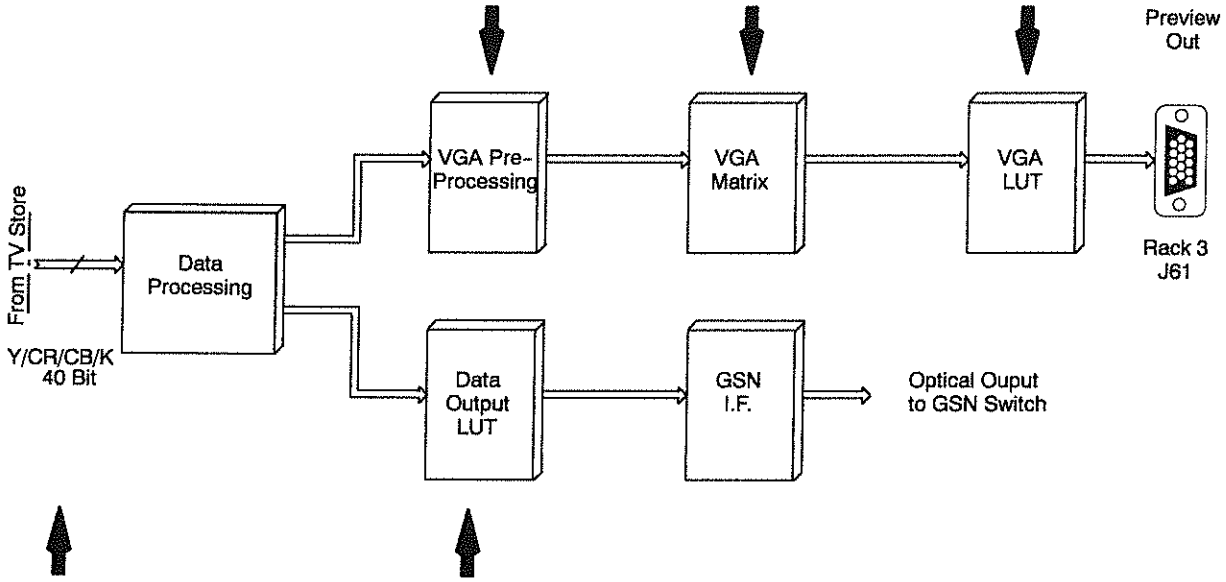
13.3 VGA Masking:

Default Matrix: **Standard**
R G B
R 1 0 0
B 0 1 0
G 0 0 1
or
user defined matrixes

Submenu Data

13.5 VGA LUT:

Default: **LUT 1:1**
or
15 User defined VGA LUTs for adjustment of the monitor color temperature



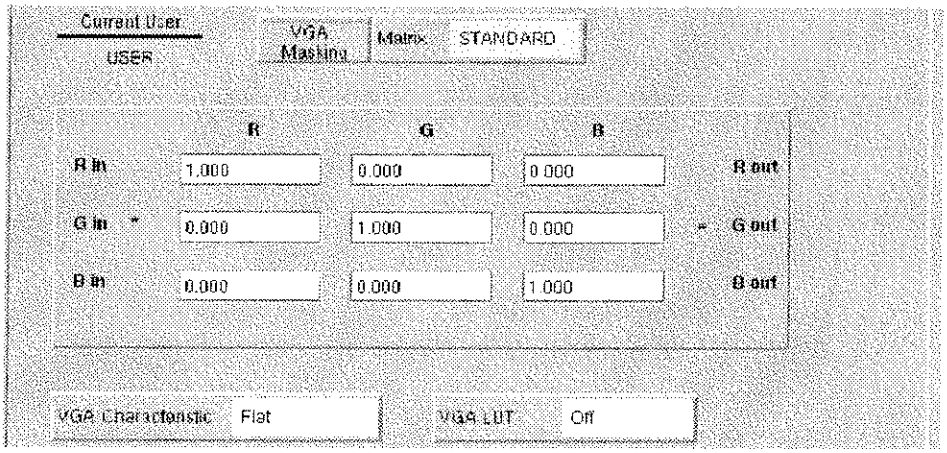
Submenu Data - *7. Output LUTs*
Log, TVLEV, GRLEV, DXR, TV-PD, DXR-G, TV_G, C-PD, UserTab 01-15

& 9. CRT Gamma

Fig. 435: Preview Monitoring Processing

13.1 VGA User Setup window

The button 13 "VGA user setup" opens the following window:



This window serves to set the following parameters:

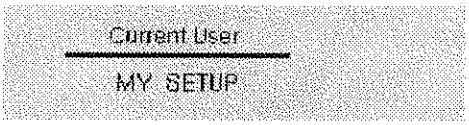
VGA Matrix

and in dependency of the Data Output - LUT "C-PD" selection:

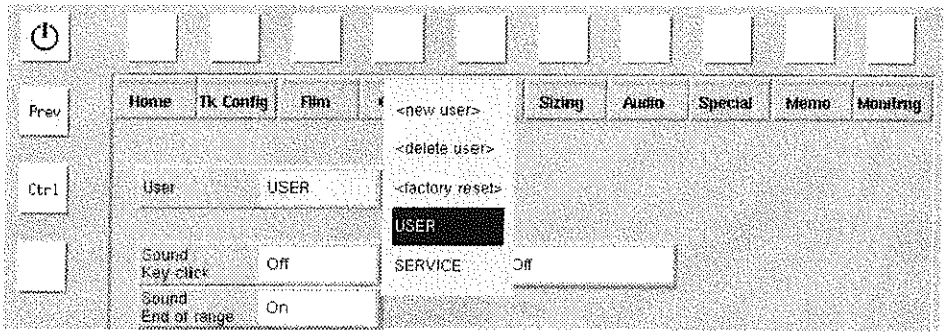
VGA Characteristic - with the options **Lin,** CRT, Flat or Print

Each user (from the login menu) can store its VGA user settings.

13.2 Current user



This window shows the current user of the VGA Setup.
The user can be defined and selected in the login menu.
Press the **"ON"** button to open the login menu.

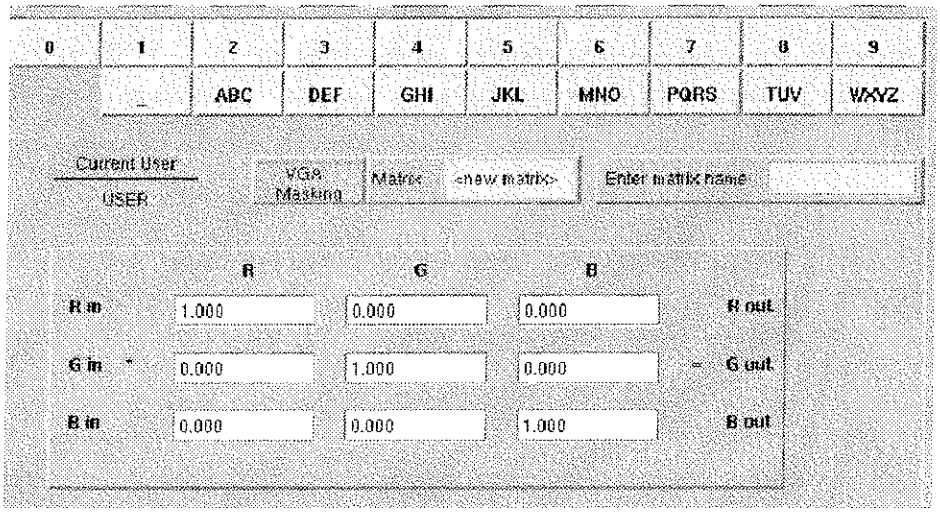


To select or set a new user make the corresponding choice.

A two lined keyboard and the concerning action buttons will be opened to set a new user.

Type in the name for the new user and confirm by pressing the **OK** button at the bottom of the dialog.

13.3 VGA Masking

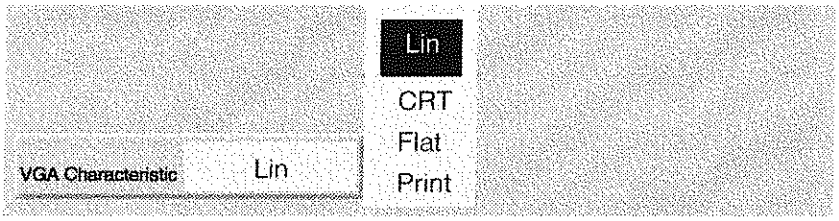

0 1 2 3 4 5 6 7 8 9
_ ABC DEF GHI JKL MNO PQRS TUV WXYZ
Current User
USER
VGA Masking
Matrix
<new matrix>
Enter matrix name
R G B
R in 1.000 0.000 0.000 R out
G in * 0.000 1.000 0.000 = G out
B in 0.000 0.000 1.000 B out

The **"VGA Masking"** serves the color adaption of the VGA path in Data mode. Adaption is made optionally by selection of fixed or variable masking coefficients.
The field "Current User", shows the selected user setup from the login menu.
A two lined keyboard is provided to set a new matrix:
First enter the **matrix name** and then select the **R G B** fields to set the **new matrix** coefficients.
Finally confirm the selection with the **OK** buttons at the bottom of the dialog.

R/G/B in * C1/9 = R/G/B out, represents the matrix equation

$$\begin{pmatrix} R\,in \\ G\,in \\ B\,in \end{pmatrix} * \begin{pmatrix} C1 & C2 & C3 \\ C4 & C5 & C6 \\ C7 & C8 & C9 \end{pmatrix} = \begin{pmatrix} R\,out \\ G\,out \\ B\,out \end{pmatrix}$$

13.4. VGA Characteristic



In dependency of the selected Data Output LUT and CRT gamma (on/off) color grading selection the display modes from table 1. page 4-70 can be selected.

Selection: **Lin,** CRT, Flat, Print

This function is redundant in the submenu "Data" section 12. "VGA Characteristic".

The following table shows the VGA Input values in dependence to
7. Output LUT,
9. CRT Gamma and
12. / 13.4 VGA Characteristic.

Spirit DataCine GSN Data Output / Default Pre-Processing

7. Output LUT	9. CRT Gamma	Preview Processing Input	12. / 13.4 VGA Characteristic		VGA LUT Input	
			GCP Display	VGA Pre-Processing	Characteris-tic	Level Range
TVLEV	ON	CRT	CRT	1:1 LUT (TVLEV Output LUT)	CRT	(4...)64*...940**(...1019)
TVLEV	OFF	LIN	LIN	1:1 LUT (TVLEV Output LUT)	LIN	(4...)64*...940**(...1019)
	OFF	LIN	CRT	CRT LUT	CRT	(4...)64*...940**(...1019)
GRLEV	ON	CRT	CRT	1:1 LUT + Black and white limiter	CRT	64*...940**
GRLEV	OFF	LIN	LIN	1:1 LUT + Black and white limiter	LIN	64*...940**
	OFF	LIN	CRT	Black and white limiter + CRT LUT	CRT	64*...940**
C-PD	-	LOG	Flat	1:1 LUT (TVLEV Output LUT)	LOG	(4...)95*...685**(...1019)
	-	LOG	CRT	DELOG+CRT/TVLEV expansion	CRT	(4...)64*...940**(...1019)
	-	LOG	Print-LOG	Print-Look from logarithmic calibrated data for CRT display	CRT	(4...)64*...940**(...1019)
TV-PD	-	CRT	CRT	1:1 LUT (TVLEV Output LUT)	CRT	(4...)64*...940**(...1019)
TV-G	-	CRT	CRT	1:1 LUT (TVLEV Output LUT)	CRT	(4...)64*...940**(...1019)
DXR	-	CRT	Flat	DXR Output LUT	LOG	(66...)95*...685**(...836)
	-	CRT	CRT	Ref. White mapping: 685=>940	CRT	64*...940**(...1019)
DXR-G	-	CRT	Flat	DXR-G Output LUT	LOG	(66...)95*...685**(...836)
LOG	-	LIN	Flat	LOG Output LUT	LOG	(4...)95*...685**(...1019)
	-	LIN	CRT	CRT+Ref. White mapping: 685=>940	CRT	(0...)64*...940**(...1019)
User .LIN	OFF	LIN	LIN	1:1 LUT (TVLEV Output LUT)	LIN	(4...)64*...940**(...1019)
	OFF	LIN	CRT	CRT LUT	CRT	(4...)64*...940**(...1019)
User .CRT	ON	CRT	CRT	1:1 LUT	CRT	(4...)64*...940**(...1019)
User .LOG	-	LOG	Flat	1:1 LUT	LOG	(4...)95*...685**(...1019)
	-	LOG	CRT	DELOG+CRT/TVLEV expansion	CRT	(4...)64*...940**(...1019)

Table 1.: VGA Input values in dependence to Output LUT, CRT Gamma & VGA Characteristic

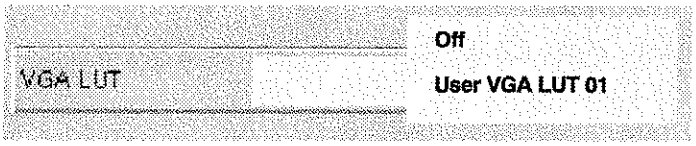
Remarks:

* = Black reference level: decimal value of a 10 bit system

** = White reference level: decimal value of a 10 bit system

- All VGA Characteristics are designed to be displayed on a CRT monitor connected to "Preview Out".
  Please use the VGA Characteristic CRT to set reference black and white on the preview monitor with brightness and contrast controls.
- If more than one setting is possible the default is marked yellow.

13.5 VGA LUT



With the **VGA LUT** the Graphics Display can be adjusted to the individual requirements by loading user defined LUTs into this area (e.g. for calibration special Print film or projector simulation ...)

Individual characteristic in R, G, and B as well as linear RGB matrixing can be applied to the preview monitoring output.

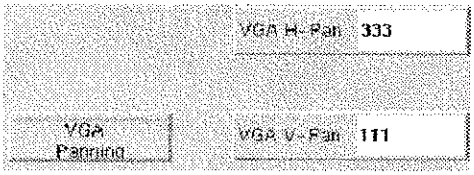
15 VGA lookup tables "User VGA LUT 01 - 15" can be downloaded and stored in the Spirit DataCine via the SDCMAINT program.

The handling of the User VGA LUTs is similar to the handling of the existing User LUTs for the main data path.

Details to create, download and store User VGA LUTs, see chapter SDCMAINT Vers. 2.23 or higher.

For instructions relating the color adaptation of the VGA Monitor or Graphics Display, refer to the documentation of the respective manufacturer.

14. VGA Panning



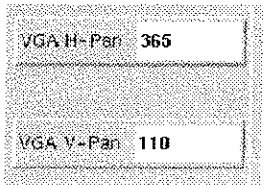
Selection: **Off** , On

Off By means of a pixel and line dropping, the scanned image is completely displayed on the VGA Monitor.

On All scanned pixels and lines are displayed on the VGA Monitor in a 1:1 display mode.

15. VGA H - Pan V - Pan

If the scanned image is larger then the VGA monitor resolution the **VGA H-Pan** and **VGA V-Pan** allow to pan the VGA image within the scanned image.



VGA H-Pan horizontal shift range of the VGA image in lines

VGA V-Pan vertical shift range of the VGA image in lines

4.3.4.2 Submenu "Data" with Option Transfer Engine TE 2101 (HiPPI Serial Data Output)

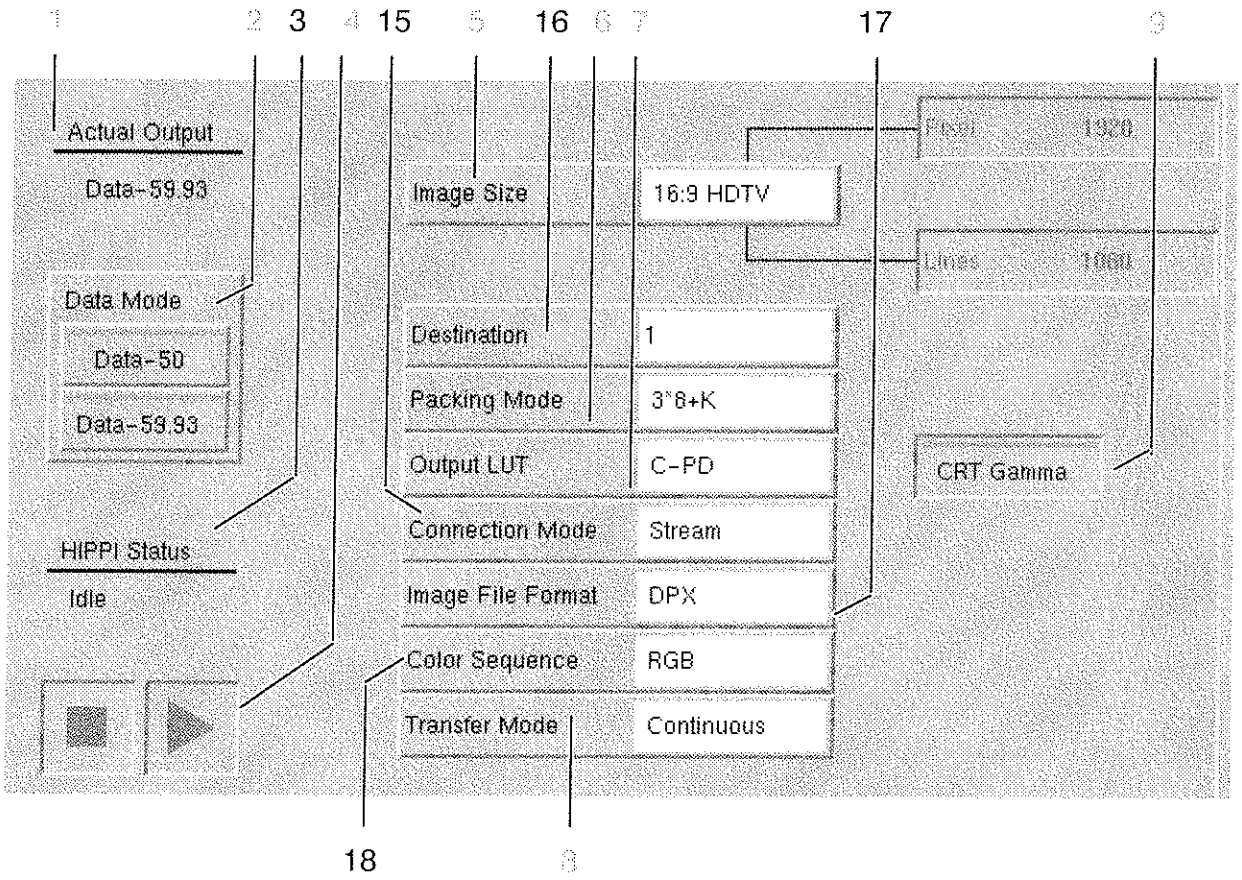


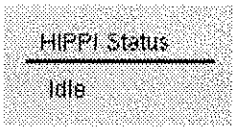
Fig. 436: Main menu **"Tk Config"** / submenu **"Data" HIPPI Output**

Overview HiPPI Output

The actual Video standard is invalid.

1. Actual Output to display the selected standard
2. Data Mode 50 / 59.93 selection
3. **HiPPi status (Option TE 2101 required)**
4. Start and Stop button for the data transfer
5. Image Size to define horizontal and vertical resolution
6. Packing mode to define the data sequences of different video components / data words
7. Output LUT maps the output data to different levels and characteristics
8. Transfer Mode provides different data flow
9. CRT Gamma switch
10. - 15. not used with Option TE 2101 (HiPPI Serial I. F.)
16. Connection Mode
17. Destination Routing
18. Image File Format Selection DPX or TIF
19. Color Sequence defines the sequence of the data out video components

3. HiPPI Status

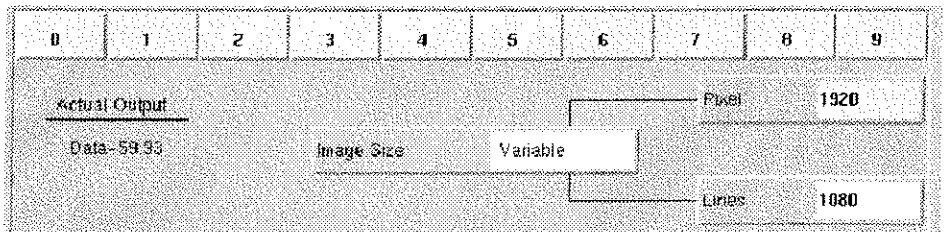


The display **"HIPPI Status"** shows the following possible messages:

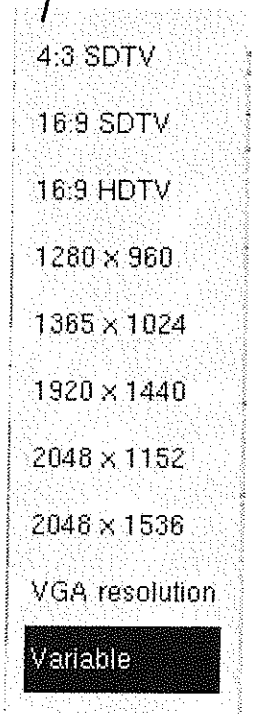
"Transfer Start"	data channel is transmitting
"Transfer Stop"	data channel transmitting has stopped
"Not Connected"	data channel not connected with external unit
"Connected"	data channel connected with external unit
"Idle"	data channel is ready
"failure"	failure occurred in the data channel

Display of the actual data rate in MByte/s.
The actual data rate is calculated by the SPC (FY 6316.xx in Rack 3).

5. Image Size



selection obsolete, new graphic necessary



This pull down menu serves to select:

"Variable" (variable dimensions)
to define vertical and horizontal resolution of the data output with:

"Pixel"
for the horizontal image size of the data output in **pixels per line**.
The actual pixel number is displayed.

"Lines"
for the vertical image size of the data output in **lines per image**.
The actual line number is displayed.

"4 : 3 SDTV" (fixed dimensions)
to display the horizontal and vertical image size for 4:3 SDTV at the data output. Image size ratio: 720 pixels x 540 lines.

"16 : 9 SDTV" (fixed dimensions)
to display the horizontal and vertical image size for 16:9 SDTV at the data output. Image size ratio: 720 pixels x 405 lines.

"16 : 9 HDTV" (fixed dimensions)
to display the horizontal and vertical image size for 16:9 HDTV at the data output. Image size ratio: 1920 pixels x 1080 lines.

only GSN I.F. **"1280 x 960"** (fixed dimensions)
Image size ratio 1280 pixels x 960 lines.

only GSN I.F. **"1365 x 1024"** (fixed dimensions)
Image size ratio 1365 pixels x 1024 lines.

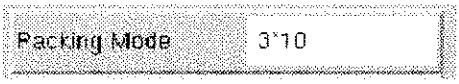
only GSN I.F. **"1920 x 1440"** (fixed dimensions)
Image size ratio 1920 pixels x 1440 lines.

only GSN I.F. **"2048 x 1152"** (fixed dimensions)
Image size ratio 2048 pixels x 1152 lines.

only GSN I.F. **"1048 x 1536** (fixed dimensions)
Image size ratio 1048 pixels x 1536 lines.

"VGA resolution"
Image size equivalent to the selected VGA resolution

6. Packing Mode



Puts data words of diverse video components together to data sequences to transmit them with a certain data rate in the GSN / HIPPI data channel.

Selection HiPPi I.F.:
3x8+K, **3x10 bit**, 4x16 bit, 3x10Y-(10bit), 2x16Y (16bit), 3xK-only (10bit)

HiPPI I.F.

"3x8+K" 3 component data words and a key data word with 8 bit resolution each are put together to a 32 bit data word (e.g.: R, G, B, K).

"3x10" 3 component data words with 10 bit resolution each are put together to a 32 bit data word (e.g.: R, G, B).

"4x16" 4 component data words and a key data word with 16 bit resolution each are put together to **two** 32 bit data words (e.g.: R, G, B, K).

"3x10Y" 3 luminance data words with 10 bit resolution each are put together to a 32 bit data word (e.g.: Y1, Y2, Y3).

"2x16Y" 2 luminance data words with 16 bit resolution each are put together to a 32 bit data word (e.g.: Y1, Y2).

"3xK-O" 3 key data words with 10 bit resolution each are put together to a 32 bit data word (e.g.: K1, K2, K3).

16. Connection Mode

only HiPPI I.F.

Defines the HiPPI operation mode.

Selection: Stream / **Datagram**

"Stream" Stream operation:
HIPPI data connection is established,
images are transferred,
connection is released only if errors occur or when the data mode is switched off.

Note: that operation mode is **not** supported by all external HIPPI adapters.

"Datagram" Datagram operation:
HIPPI data connection will be established for each image,
image will be transferred,
connection will be released again.

Note: that operation mode is supported by **most** of the external HIPPI adapters.

17.Destination only HiPPI I.F.

"Destination" routing takes the number, entered with the number keys on top of the menu and inserts the information as logical destination into the HiPPI data stream.

Range of destination: 0 ... 255

This information will only be used if the Spirit DataCine film scanner is used together with a HiPPI switch.

Note:
The switch has to be programmed with the installed physical destination addresses, in order to pass the data stream to the desired logical destination. (e.g. *set destination* logical address 1 *to* physical address 1)

A physical address can be the slot number or connector number of the HiPPI switch.

18.Image File Format

Defines the image file format. Each image is a separate file.

Selection: **DPX** / TIFF

"DPX" DPX format
(Digital moving Picture eXchange format)

"TIFF" TIFF format
(Tag Image File Format)

Note!
The Tag Image File Format (TIFF) can only be used together with 3x8+K or 3x16+K packing mode.
All other packing modes generated files are not according to the TIFF standard.

19.Color Sequence only HiPPI I.F.

Defines the sequence of the digital video components in the 32 bit data word.

Selection: **RGB** / GBR

"RGB" sequence: R, G, B

"GBR" sequence: G, B, R

4.3.5 SUBMENU "TIMECODE"

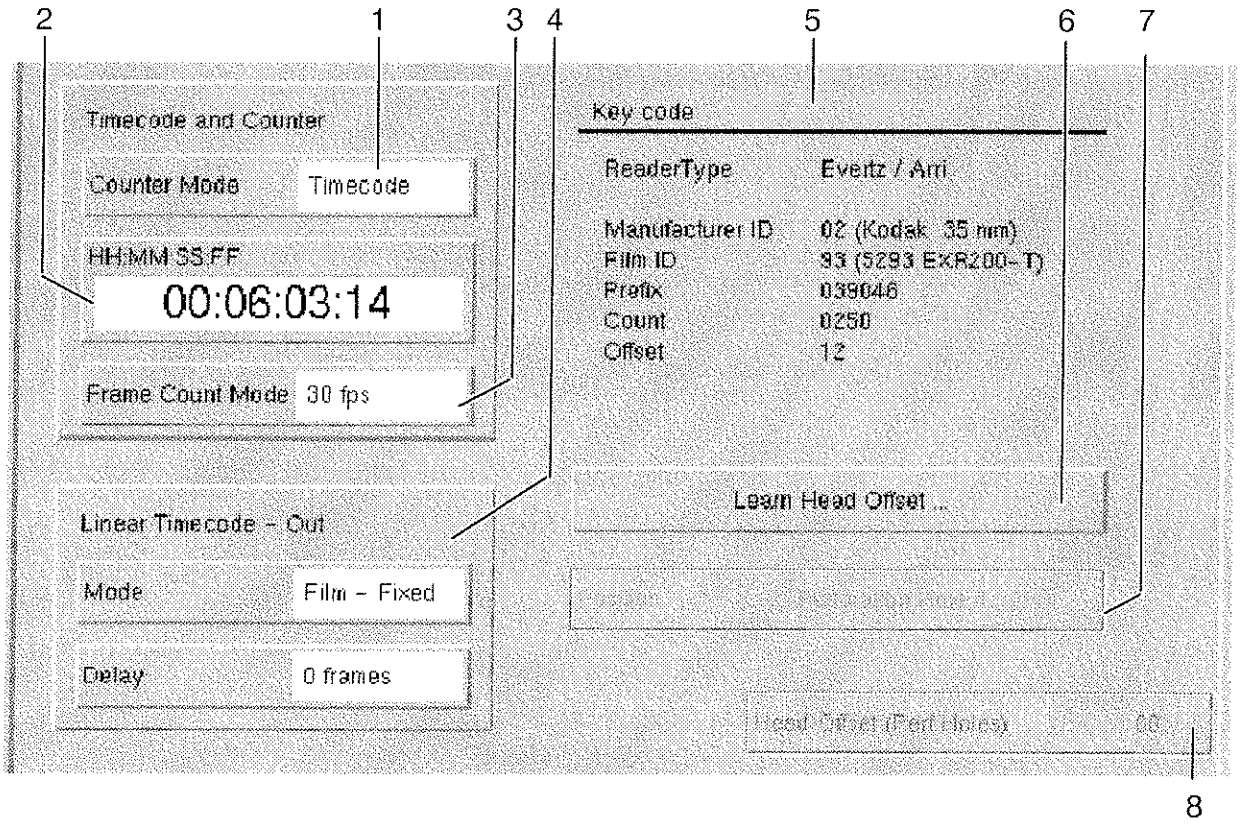


Fig. 437: Main menu **"Tk Config"** / submenu **"Timecode"**

Overview

The main menu **"Tk Config"** / submenu **"Timecode"** serves to set the linear time code, to adjust the frame accurate counting of film frames and keycode (4perf 35mm film and 1perf 16mm film).

LTC

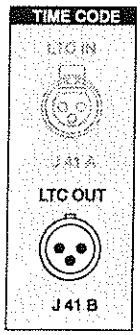
1. Time Code and Count area with Counter Mode selection
2. Display of counter position and setting
3. Frame count mode, selection of the frame rate
4. Linear Timecode Out, settings of LTC

Keycode

5. Keycode display of the current keycode
6. Learn Head Offset window, to set the head offset automatically
7. Position, to select the perforation hole 1, 2, 3 or 4 of the "zero frame mark"
8. Head Offset, to select/display the number of perforation holes between key code reader head and film gate (illumination slit). Factory setup: 62 perf holes for 16mm and 35mm films

Remarks concerning Linear Time Code (LTC)

Rack 3



ILTC, compatible to the SMPTE 12M standard, is available at J41 LTC OUT Rack 3 from SDC 2001 operating software V4.10 onwards and will always be generated in **"non drop frame mode".**

Assignment of userbits

If a keycode reader is installed, the keycode will be mapped into the userbits.

Restrictions of LTC operation

- **LTC transfer via TE 2101 Transfer Engine Package 101**
  The transfer of LTC via Transfer Engine 101 to a workstation (e.g. OS2 / SGI) causes a fixed delay of one frame. Example: Spirit DataCine SDC 2001 sends LTC 00:00:00:00, Transfer Engine reads 00:00:00:01.
  Problem can be solved with LTC Delay in this submenu

- **LTC synchronizing for SEPMAG players**
  Do not feed the audio signal of an externally connected Sepmag player, synchronized with LTC output (J41 LTC OUT Rack 3) from the SDC 2001, through the audio system of the SDC 2001 - Audio 1/2 In to Audio 1/2 Out - for a signal mix of SDC 2000 audio and Sepmag audio.
  In this case audio is delayed versus video, because it passes the film scanner audio delay which is active for audio, coming from the audio head of the DataCine SDC 2000.
  A Sepmag player synchronized with the bi-phase signal (J25 SEPMAG OUT Rack 2) from the SDC 2000 operates correct, audio / video are synchronal.

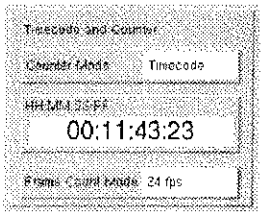
Notes!

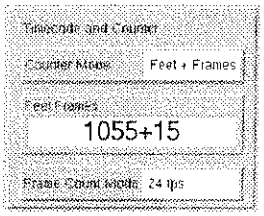
- **Drop frame / Non drop frame mode**
  Drop-frame compensation for the 59.94 Hz standard is not supported.
  SDC 2001 operates always in **"non drop frame mode"**.
  That means, that for film speeds 30 or 24 fps and TV standard "59.94 Hz interlace" always 30 / 24 time code values are generated.

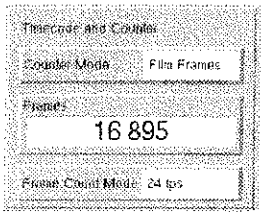
- **Counting mode for progressive standards**
  For all 59.94 / 60 Hz progressive standards **one time code value** is allocated to **two frames.**

Function Buttons, Controls & Displays - Timecode

1. Counter Mode







The upper line shows the Counter Mode in which the telecine is currently counting.

Three different modes are selectable: **Timecode, Frames, Feet & Frames.**

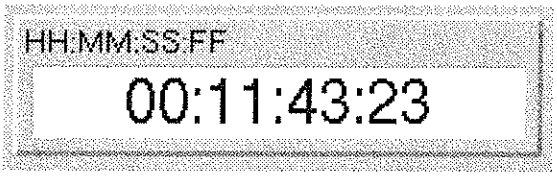
To change this mode, click on the key and make your choice from the drop-down menu.

The display shows the current Counter Position of the telecine.

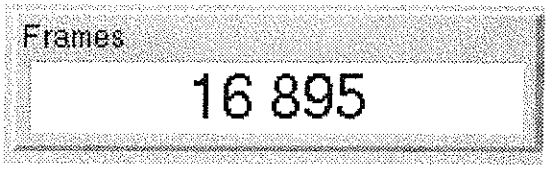
The lower line shows the Frame Count Mode depending on the output standard.

2.Counter Display

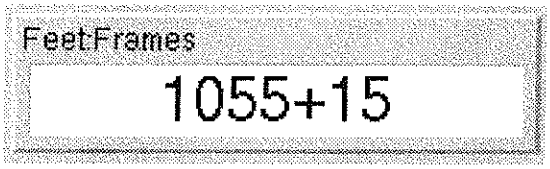
Display of the counter position



Film TC

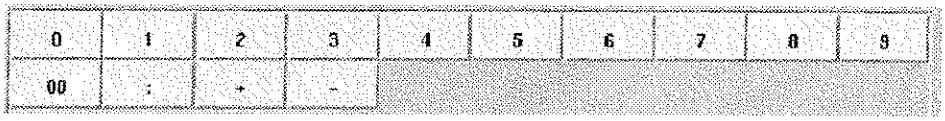


Film Frames

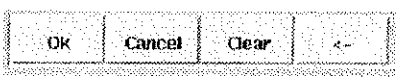


Keycode value

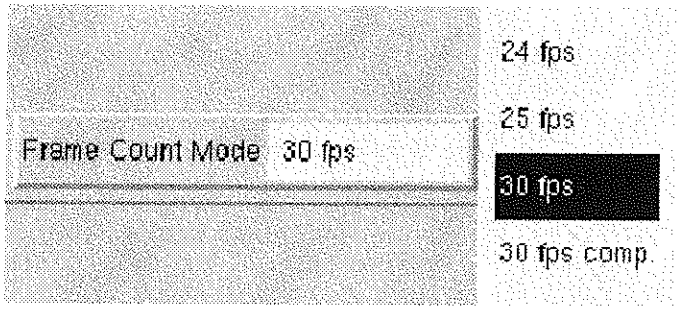
Counter Setup



To enter the counter value, touch the display area and use the numeric keyline and the function buttons.



3. Frame Count Mode



Selection of the standard-dependent timecode operation mode.

Following frame count modes are selectable:

24 frames:	for 24 frames/sec and 60 or 59.94 Hz video systems
25 frames:	for 25 frames/sec and 50 Hz video systems
30 frames:	for 30 frames/sec and 60 Hz video systems
30 comp.*:	for 24 frames/sec and 60 or 59,94 Hz video systems

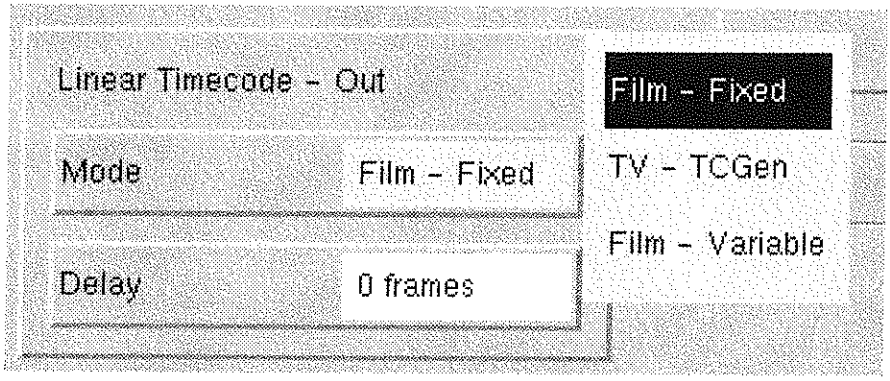
*** Note:**

30 comp. = 30 frames compensated
In 24 fps mode the frames are numbered from 0 to 29, but each fifth digit is dropped:

0, 1, 2, 3,	5, 6, 7, 8,
10, 11, 12, 13,	15, 16, 17, 18,
20, 21, 22, 23,	25, 26, 27, 28,
0, 1, 2, ...	

4. LTC-Out

Mode



Serves to select Linear Timecode operation mode.

Linear Timecode should not be mixed up with the Longitudinal Timecode generated in a VTR. One possible application of this feature is the synchronization of external devices, such as DAT or Sepmag Players, it can also be used to feed the external Timecode In of the Recorder VTR or the Phantom Transfer Engine for HD transfers into the SGI HD Input/Output board.

With the upper key, Linear Timecode Mode settings can be made. The current mode is displayed on the key.
Three different modes are selectable: Film Fixed, TV-TC Gen and Film Variable.
To change this mode, click on the key and make your choice from the drop-down menu.

"TV-TCGen" In this mode the LTC signal is locked to the TV signal and has to be used when the timecode output of the film scanner is connected to the timecode input of a video tape recorder.
For every video frame, a unique timecode number will be generated.
For 24 fps film speed and 59.94 /60 Hz TV-systems the repeat rate of video fields is taken into account.
This mode can only be used with the following settings:

	TV Standard	Film Speed	Frame Count Mode
1	50Hz	25 fps	25
2	59.9Hz/60Hz **	24 fps	24
3	59.9Hz/60Hz **	30 fps	30
4	24 progressive	24 fps	24
5	59.94Hz/60Hz pro-gressive	24 fs	24 ***

** = non drop frame mode

*** = Two frames are allocated to one time code value

"Film-Fixed" Operates like mode TV-TCGen, but the frame numbers are always related to film.
Therefore TC numbers with the same value can be transmitted multiple times at slow speeds.
Frame numbering is done according the Frame Count Mode setting.

"Film-Variable"

In mode film-variable, the LTC frequency is variable in the range from 12 fps to 57 fps.
For every video frame a unique timecode number will be generated.
For all other speeds the FILM-fixed mode will be used automatically.
Frame numbering is done according the Frame Count Mode setting.

Note!
LTC displayed in the TC-field of each main menu is calculated according to the LTC of the Time Code Menu
(see also parameter "Frame Count Mode").

Delay

The lower key shows the current delay.

Different settings are needed in order to match the Linear Timecode timing with delays introduced by external devices. The possible selection ranges from 0 to 3 frames. "0" means no delay active.To change, click on the key and make your choice from the drop-down menu.

Note that the telecine has to be in STOP mode.
This function is important for transfers into the SGI HD i/o board.
Following LTC count modes are selectable:

"0" no delay of LTC signal

"1 - 3" 1 - 3 frame(s) delay of LTC signal

Different delays can be selected in order to match the timecode signal with delays introduced by other external devices.
LTC setting can be selected between 0 and 3 frames.
The default delay after a power-up is 0 frames.
Changing LTC delay is only accepted when the filmdeck is in STOP mode.

4.3.6 KEYCODE SETUP

Pressing **"Learn Head Offset"** opens this window

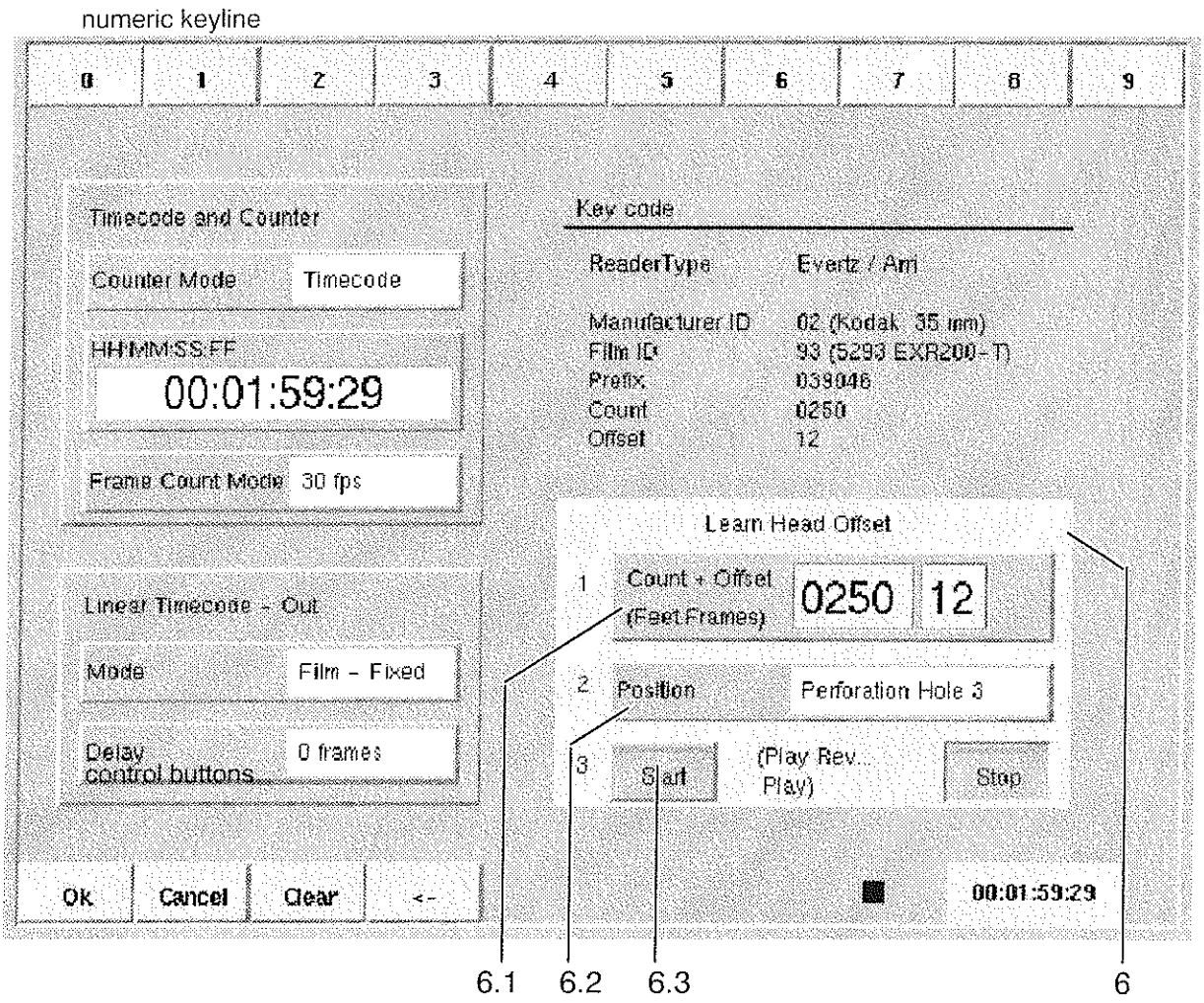


Fig. 438: Main menu **"Tk Config"** / submenu **"Timecode"** / window **"Learn Head Offset"** opened

Overview

6.1 Window Learn Head Offset / Count & Offset

6.2 Position serves to set the perforation hole at the zero frame mark

6.3 Start / Stop button for head offset processing

6 Learn Head Offset This window serves to set the keycode parameter "Keycode position" and "Head Offset" via learn mode automatically.

6.1 Count + Offset **"Count + Offset"** serve to set the film length in feet and frames.

For setting push the **"Count + Offset"** window.
Numerical buttons will appear at the top of the screen.
Type the requested values and enter with the Ok-button below.

6.2 Position Serves to set Keycode position (always perf 1 for 16mm films) and determine the "Zero Frame Reference Mark" at the perforation holes 1 - 4 for 35mm film, see Fig. 442: .

6.3 Start — Starts the learn mode for setting the "Head offset" in "perforation holes".

Stop — Stop aborts the learn mode.

4.3.7 CHECKING AND OPERATING KEYCODE GENERATION

The operating procedure applies to keycode data reproduction including insertion into the ancillary data of the HiPPI output and into the user bits of the LTC Out and SDTV (Video + VITC).

EVERTZ / AATON ARRI Keycode Reader

The data is generated by a keycode reader from the manufacturers EVERTZ, AATON Keylink System V.8 or ARRI.
For details see the system applications in the Customer's Manual "Planning & Information" chapter 3.

Pre-conditions & Restrictions

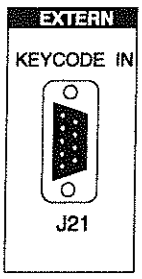
- he system operates only with 4 perf 35mm and 1 perf 16mm films correct.
- AATON Keylink system V 8.2 or higher is required.
- Evertz Keycode reader models 5500 and 5550 are tested by Thomson.
- 2, 6 and 8 perf film material are not supported from the AATON, EVERTZ and ARRI keycode readers.

Note concerning Keycode Reader setup!

The setup procedure for 16mm and 35mm (1, 3, 4 perf) film material is the same.

1. Check the connection from the keycode reader head to the reader device (decoder).

SDC 20001 Rack 2



2. Check the connection from the keycode reader device (decoder):

EVERTZ:
"Serial I/O" to the keycode reader input of SDC 2001 Rack 2 - EXTERN KEYCODE IN J21 (9 pin / RS 232).

Cable

Evertz 5500 / 5550	SDC 2001
Sub-D 9 pin (male)	Sub-9 pin (male)
3	2
2	3
5	5 GND

ARRI:
"Serial I/O" to the keycode reader input of SDC 2001 Rack 2 - EXTERN KEY-CODE IN J21 (9 pin / RS 232).

Cable

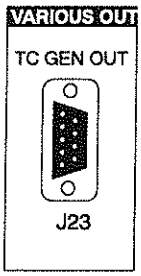
ARRI	SDC 2001
Sub-D 9 pin (male)	Sub-9 pin (male)
2 ----------	2
3 ----------	3
5 ----------	5 GND

AATON:
"Keylink Com 1" to the keycode reader input of SDC 2001 Rack 2 - EXTERN KEYCODE IN J21 (9 pin / RS 232).

Cable 1

AATON	SDC 2001
Sub-D 25 pin (male)	Sub-9 pin (male)
3 ----------	2
2 ----------	3
7 ----------	5 GND

Rack 2



Cable 2 (is part of the AATON Keylink System)

Keylink PC "MTC board top socket" to the bi phase sync signal output of SDC 2001 Rack 2 - TC GEN OUT - J23 (9 pin / control I.F.)

3. **Only for AATON Reader!**
   Adjust bi phase pulse to one pulse per frame.

   Select menu Special - submenu Extern D (Devices)

   Choose parameter "TC Generator Out Coupling" and set -1*BiPhase

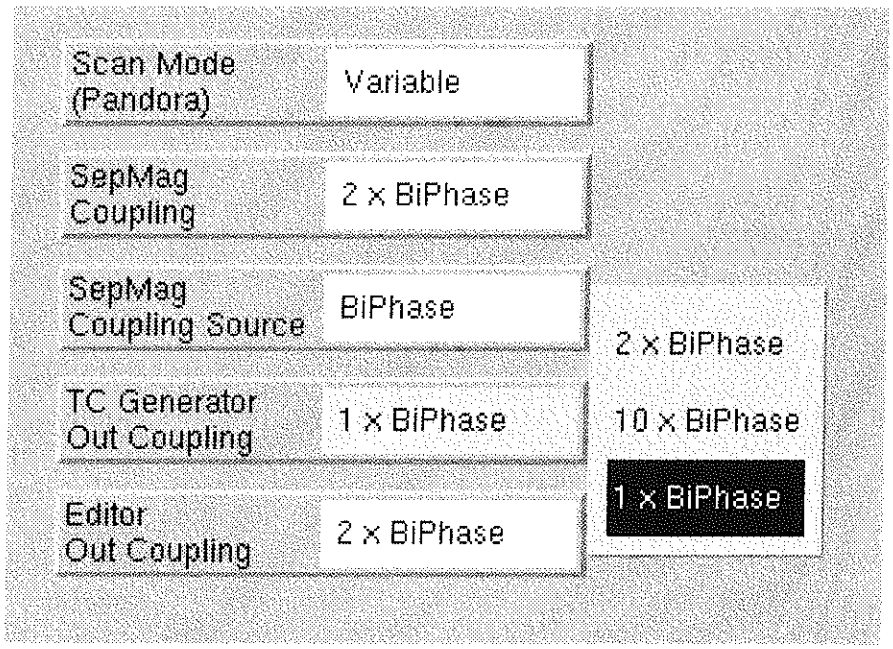


Fig. 439: Main menu **"Special"**, submenu "Extern D"

4. Thread a 16mm or 35mm film with keycode.

5. Select Play mode

6. Adjust the keycode reader settings (film type, intensity, ...) as described in the keycode reader manual (EVERTZ / AATON / ARRI).

7. Open the Timecode menu
   The current keycode should be displayed, "count" and "offset" values should change.

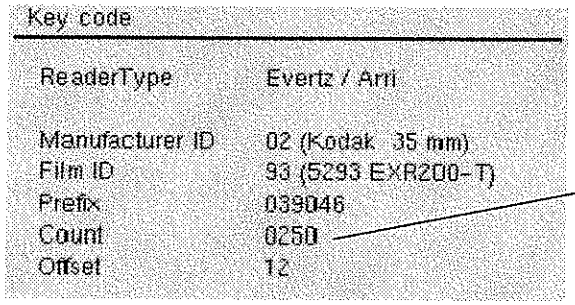


Fig. 440: Window **"Key Code"** section of submenu **"Timecode"**

8. Select STOP mode

9. Open submenu "Timecode" window.
   "Key Code" setup will be displayed.
   Adjust the reader head offset as described in chapters "Manual Setup" 4.3.8 or Learn Mode "Head Offset" 4.3.10

10. Check that the correct reader type is displayed in the "Key Code" setup window.
    Reader type:
    EVERTZ, AATON or ARRI

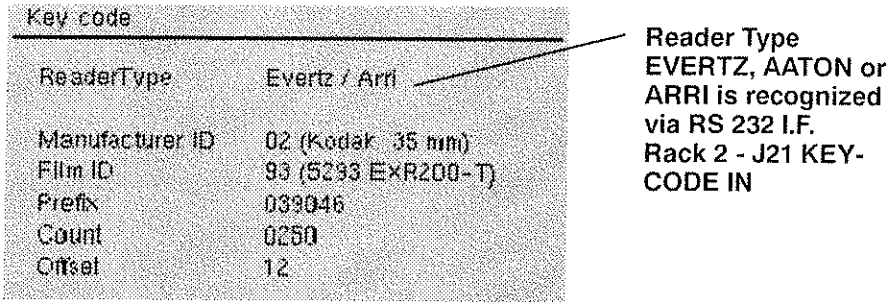

Key code
ReaderType Evertz / Arri
Manufacturer ID 02 (Kodak 35 mm)
Film ID 93 (5293 EXR200-T)
Prefix 039046
Count 0250
Offset 12
Reader Type EVERTZ, AATON or ARRI is recognized via RS 232 I.F. Rack 2 - J21 KEY-CODE IN

Fig. 441: Window **"Key Code"** setup

4.3.8 MANUAL SETUP

Adjust Reader offset

1. Set **head offset** in "perforation holes" (default value: 62 for 16mm and 35 mm films); the distance (amount of perforation holes) between reader head and film gate (illumination slit).
   Use the numerical buttons to insert the "head offset" value.

2. Set **keycode position** (always "perf-1" for 16mm films)

Zero Frame Reference Mark

Determine the "Zero Frame Reference Mark" at the perforation holes 1 - 4, for example perforation hole 3 as shown in the next figure.

35mm 4 perf Film with Keycode

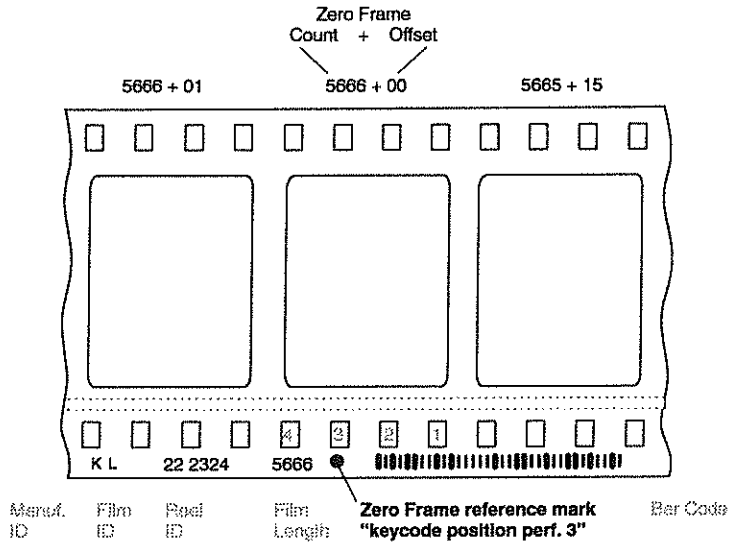


Fig. 442: 35mm 4 perf film with keycode

Keycode position and head offset are set manually!

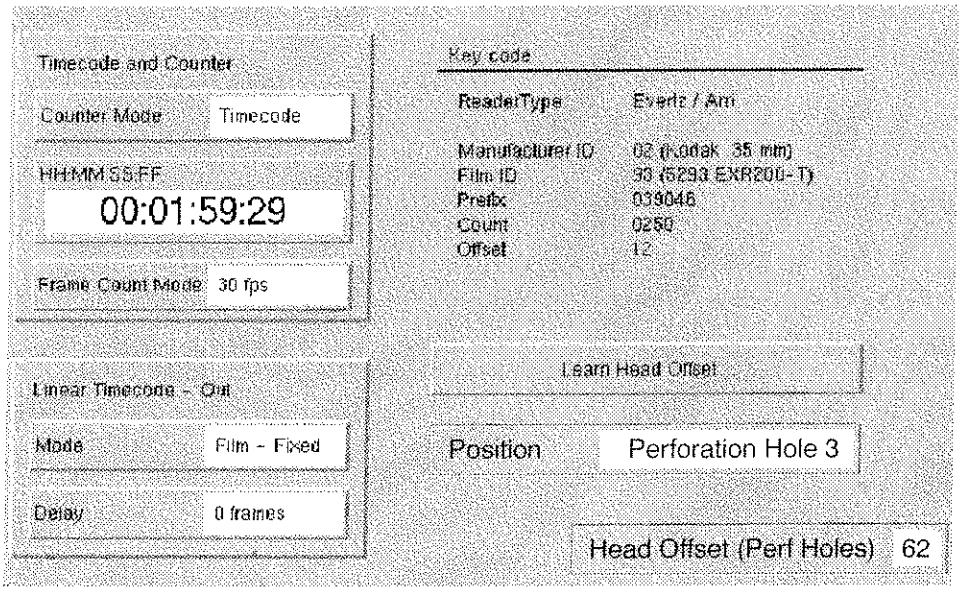


Fig. 443: Main menu **"Tk Config"** / submenu **"Timecode"**

3. Check the Keycode

   Play a short piece of film and take care that any Keycode is read on the reader device and compare the keycode of the currently scanned frame with the displayed code in the submenu "Timecode".

   Window "Key Code"

   Count: Film length in feet
   Offset: Frame offset (e. g. 0 -15 for 4 perf 35mm film)

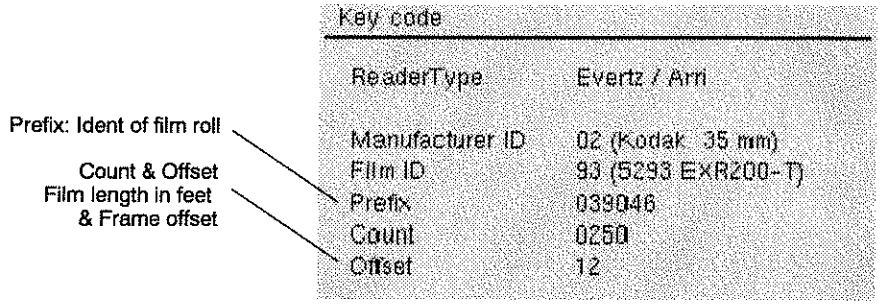


Fig. 444: Submenu **"Timecode"** / window **"Key Code"**

4.3.9 REMARKS CONCERNING THE KEYCODE NUMBERING

Important!
In general the system ensures that the keycode numbering related to the film frames is always correct for the different film perforations (1, 3, 4).

Keycode numbering for 3, 4, perf 35mm films

To avoid an ambiguity of the keycode to the film frame the keycode offset is calculated according to "SMPTE Recommended Practice RP 195-1998" as follows:
*Keycode number repetition rate **K** (64 perf) modulo the frame repetition rate **R** (e.g. 4 perf per frame for a 4 perf 35mm film).*

For details, see the next table.

Offset matching for 35mm films

Keycode number repetition rate = 64 perforation holes
(16 frames for 4perf 35 mm film or 21/21/22/21/21/22.. frames for 3perf 35mm film)

Frame Repetition Rate Perf/Frame	**Keycode Count** (in feet)	**Offset** (in frames)
3	xxxx	+00 .... +20 (21 frames) foot 1/2/4/5 +00 .... +21 (22 frames) foot 3/6..
4	xxxx	+00 ... +15 (16 frames)

Defining the first foot of 3 perf films:
The first foot is the foot in which the reference mark appears within the first K-modulo-R perforations.

Example:
In numbering the frames of 35mm **3 perf**, by convention, the first foot and second foot each include 21 frames, numbered +00 through +20, and the third foot includes 22 frames, numbered +00 through +21.

The first foot is the foot in which the reference mark appears at the **first** perforation after the frame line at the start of the foot, as shown below.

35mm 3 perf Film with Keycode

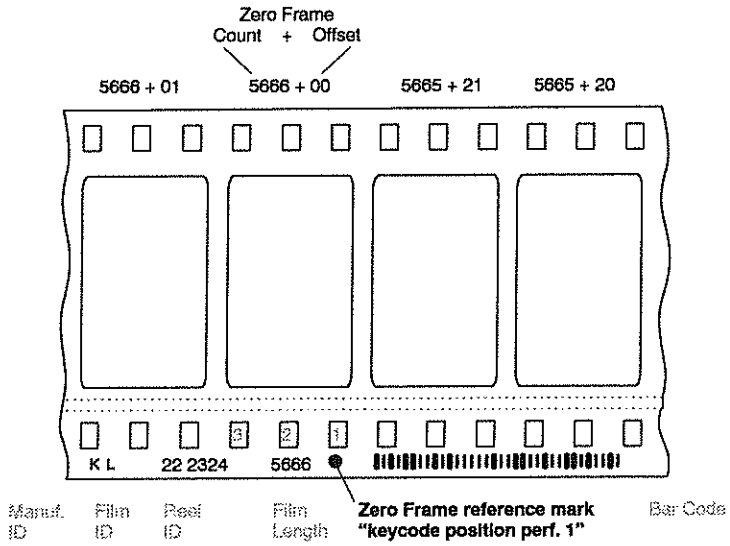


Fig. 445: 35mm 3 perf film with keycode

Offset matching for 16mm films

Keycode numbering for 1 perf 16mm films

Keycode number repetition rate = 20 perfs!

Perf/Frame	Keycode Count	Offset
1	xxxx	+00 .... +19 (20 frames)

4.3.10 LEARN MODE "HEAD OFFSET" (AUTOMATICALLY)

1. Mark a reference frame on the film
   and note the respective keycode (count) printed on the film edge and the offset which is the number of frames between the **zero frame** (Count xxxx+ offset 00) and the **marked frame**.

   Example of the marked frame below: Count = 5666 Offset = 01

35mm 4 perf Film with Keycode

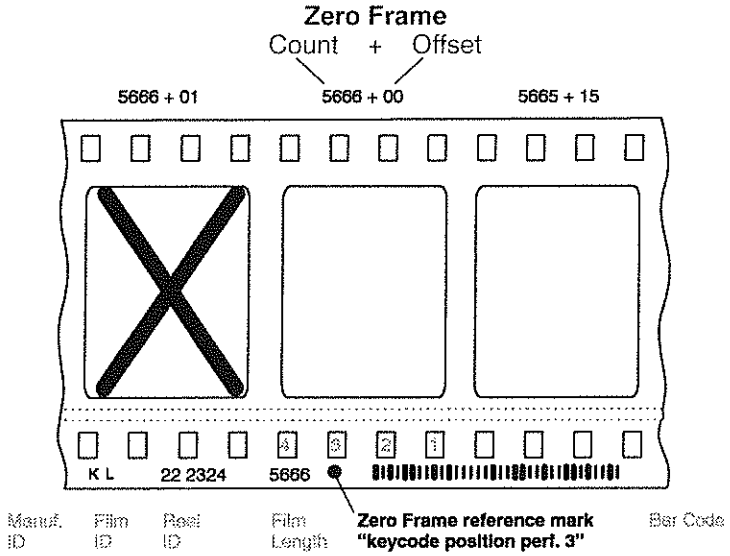


Fig. 446: 35mm 4 perf film with keycode with marked reference frame

2. Park the film at the marked reference frame (Film gate position, illumination slit))

3. Set keycode **Position**

   (always "perf 1" for 16mm films)

   Determine the perforation hole which is marked with the dot of the "Zero Frame Reference Mark" (for example "perf 3" as shown in figure Fig. 446:).

Position	Perforation Hole 3

4. Set **Count** and **Offset** of the reference frame from step 1
   Submenu "Timecode" / window "Learn Head Offset".
   Set both with the numeric keyline.

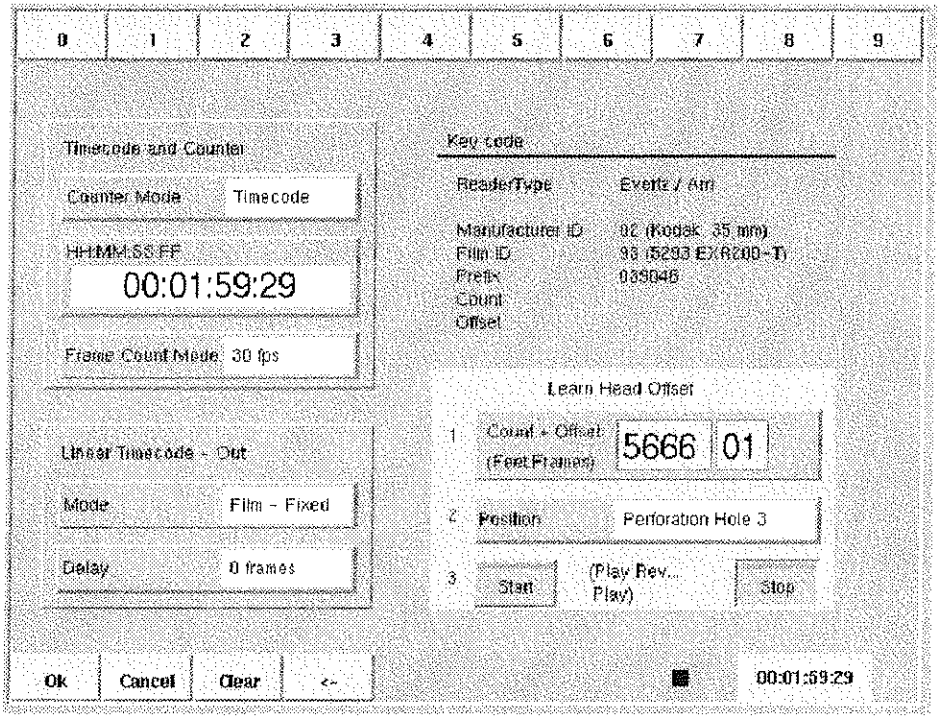


Fig. 447: Submenu "Timecode" with window "Key Code" setup

5. Press **"Start"** to execute the learn mode

   While the SDC 2001 is in the "learn mode", softkey **"Start"** is activated.

   Using **"Stop"** aborts the "learn mode".

6. Rewind a short piece of film

   Select PLAY mode and transfer the scene which includes the reference frame.
   Take care, that at least one keycode is read during this transfer.
   If the SDC 2001 has **learned the head offset** successfully, learn mode softkey **"Stop"** is activated again.
   If an error occurs during this procedure, a warning message will be displayed.
   Then you have to retry the head offset learning procedure.

7. Check the keycode
   Play a short piece of film and take care that any keycode is read on the reader device and compare the keycode of the currently scanned frame with the displayed code (count & offset) in submenu "Timecode".
   Field Keycode:
   Count: FIlm length in feet
   Offset: Frame offset

4.3.11 REMARKS CONCERNING "KEYCODE IN DATA, VITC & LTC

Data Output

- For inserting keycode in DPX data, the option TE 2150 Transfer Engine Package including FY 6345 Data Output board and the serial I/O HiPPI interface is required.

- The keycode generated in the SDC 2001 is available in the DPX Data and with the appropriate Keycode Encoder at the video outputs (Video + VITC) and LTC out.

Servo Locked

- Keycode is only evaluated if the servo is locked.

If count errors occur

- If keycode "count" and "offset" do not match to the right frame, please check that the keycode position (reference dot) and "head offset" are properly adjusted.

Auto Adjust

- If the keycode position (reference dot position) changes during a transfer with a fixed speed, the system automatically adjusts the new position.

  Note for EVERTZ Reader!
  This works only, if at least one keycode before the position change and one keycode after the change are read with the same speed and play direction.

Reader Type

- The reader type (AATON, Evertz or ARRI) is automatically adjusted after the reader has read and transferred any key code to the SDC 2001.

The Standard

- Additional information about the keycode standard see also www.kodak.com.

Keycode Display

Specter VDC 2000 & Phantom Transfer Engine

- The keycode information is also available in addition to the timecode information on the timeline of Specter VDC 2000 and the Phantom Transfer Engine, if the DPX header contains valid keycode information.

  Only the keycode of the current playout frame is displayed.

Keycode Display Specter VDC 2000

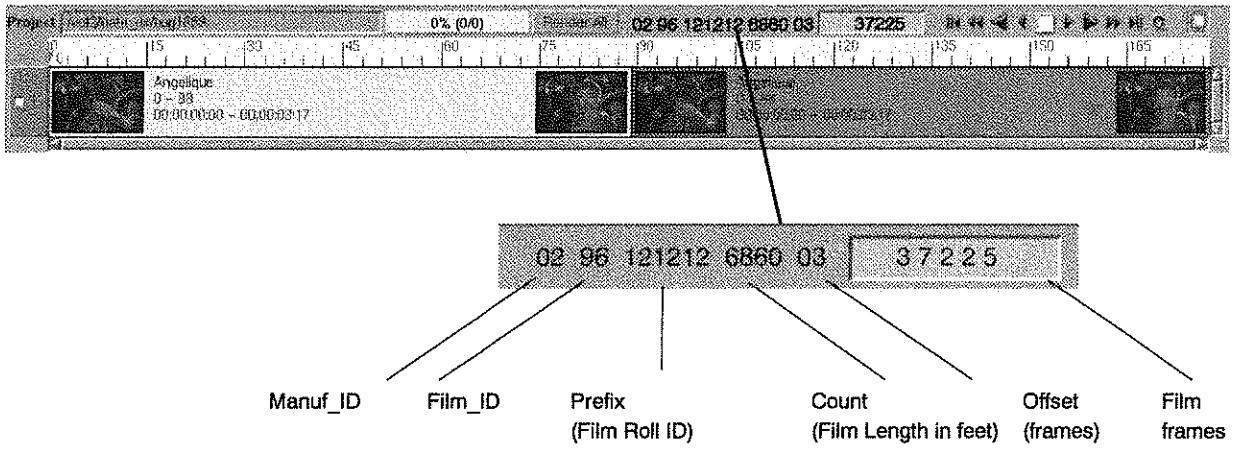


Fig. 2: Keycode Display Specter VDC 2000

Keycode Display Phantom Transfer Engine

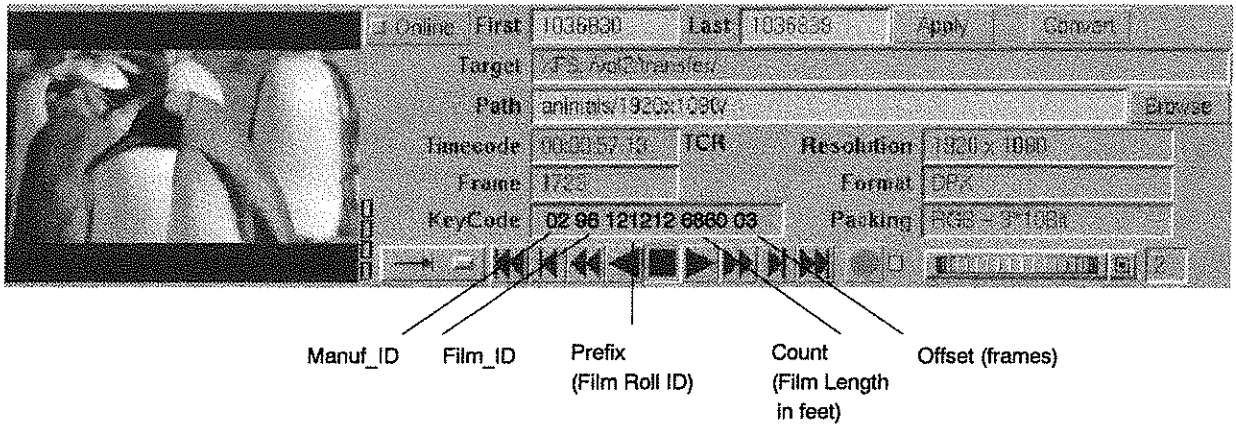
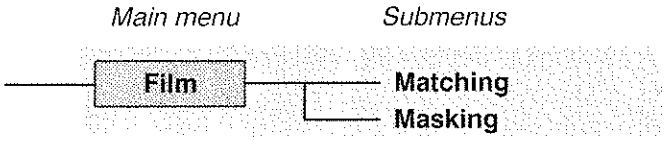


Fig. 3: Keycode Display Phantom

4.4 FILM MENU



4.4.1 SUBMENU "MATCHING"

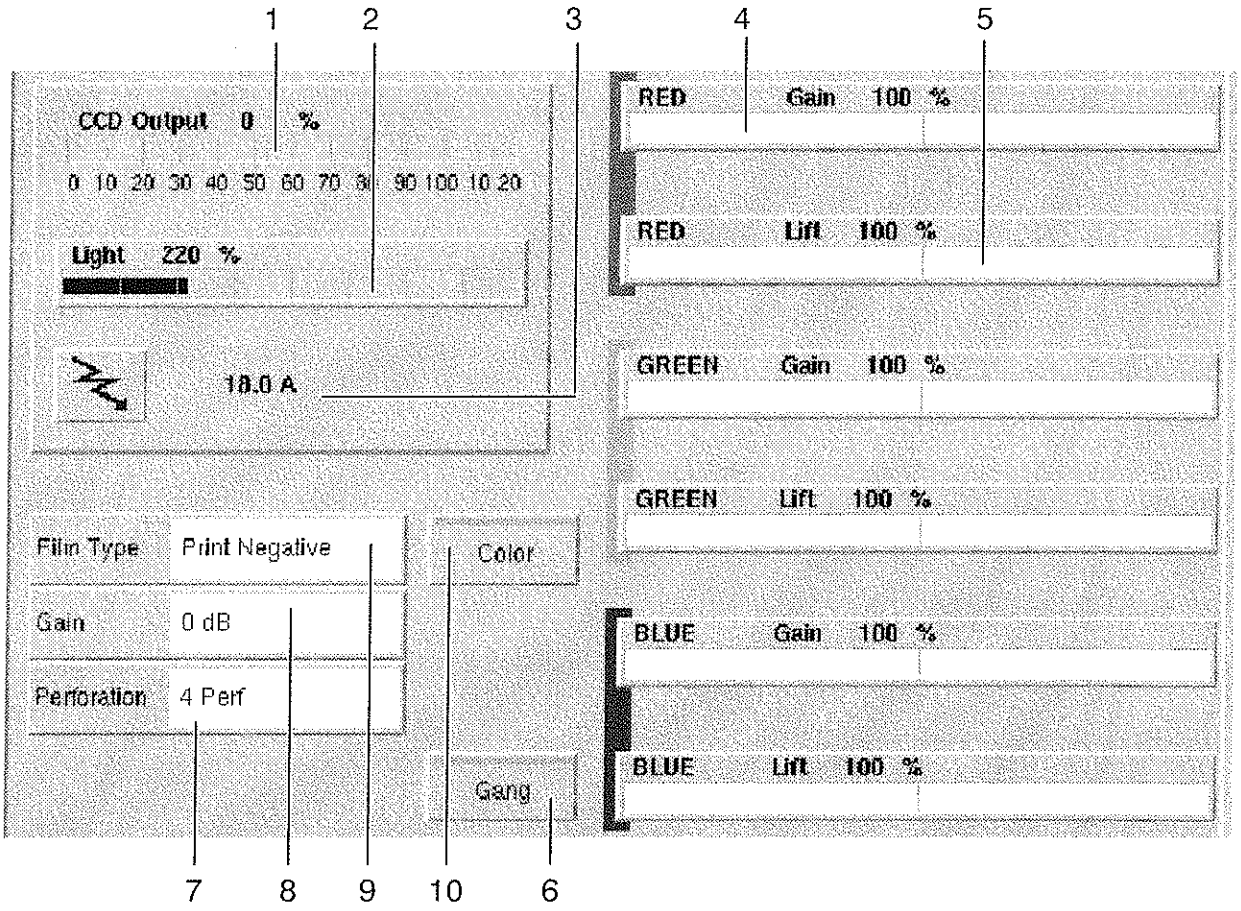


Fig. 404: Main menu **"Film"** / submenu **"Matching"**

Overview

The main menu **"Film"** / submenu **"Matching"** shows the user the matching settings in the black (Lift) and white (Gain) areas, the intensity of film illumination, the video level and the film settings (film type and video basic gain):

1. Video, display of film video level (in %)
2. Light, display and setting of intensity of film illumination (in %)
3. Display of Xenon lamp current in Ampere (A)
4. Gain, display and setting of R/G/B matching settings in the white areas (in %)
5. Lift, display and setting of R/G/B matching settings in the black areas (in %)
6. Perforation, display and setting of film perforation (2 - 6 Perf)
7. Gain, display and switching the analog gain (0 / 6 db)
8. Film Type, display and setting of film type (e.g. Pos / Neg)
9. Color, to switch on / off the color information
10. Gang to adjust all the "Lifts" and all the "Gains" (RGB) coupled or separated

1. Illumination Adjustment

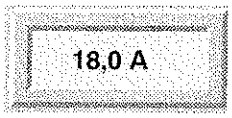
Serves for setting the intensity of film illumination and adjusting the video level.

2. Light

Display and control of lamp current.
When exiting the selection, the last illumination intensity value is stored.

3. Display

Xenon lamp current display.



Attention!
Exceeding 22A lamp current may shorten the life span of the bulb.

Shot button,
serves during Play for setting the intensity of film illumination once to **100% video level**.

4. Gain

This window serves to define the (analog) basic gain of the video amplifier in the AIH (Analog Image Head).

Selection: 0 dB / 6 dB

"0 dB" simple basic gain x 1

"6 dB" double basic gain x 2

5. Lift Red/Green/Blue

Bar graph matching **Lift** for **RED, GREEN** or **BLUE** serves for setting the RGB **black** level matching.

6.

Gang

The **adjustment** of the RGB black levels (lift) and RGB white levels (gain) can either be done by setting each level **separately or** all the "Lifts" and all the "Gains" **together**.
If the button "Gang" is switched on, the three black levels and the three white levels can be adjusted together with either one digipot or slider. E.g. the "Red Gain" level is changed and the "Green Gain" and "Blue Gain" levels follow in the same way.
The ratio between the three levels ("Gains" or "Lifts") is maintained in this operation mode.

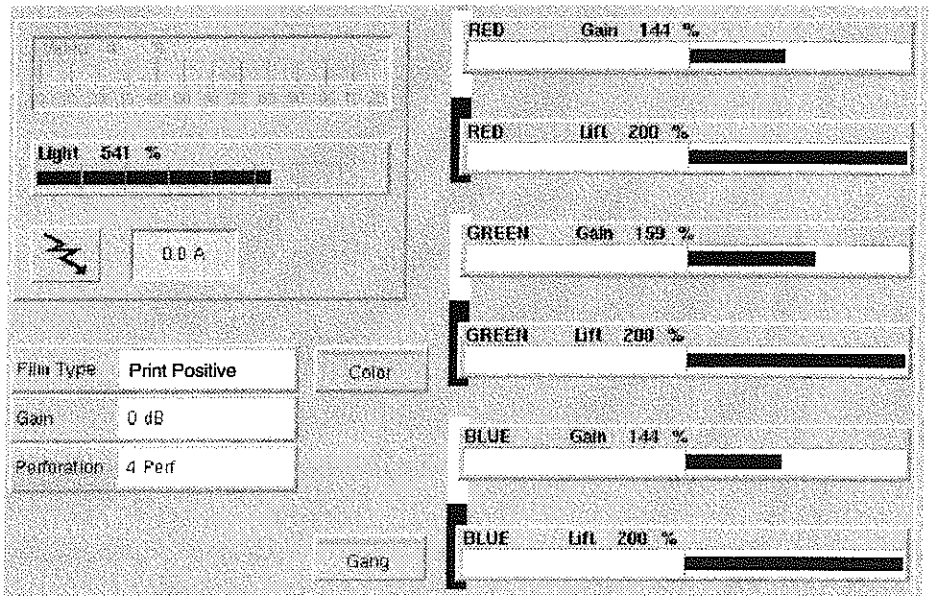


Fig. 405: Submenu **"Matching"** with coupled adjustment of all "Lifts" and "Gains" (RGB)

7. Perforation

This window serves for perf selection in dependence on the film to be played. The number of perforation holes per film frame determines the value to be set.

Selection: **2 PERF** / 3 PERF / 4 PERF / 6 PERF / 8 PERF

8. Gain Red/Green/Blue

Bar graph matching **Gain** for **RED, GREEN** or **BLUE** serves for setting the RGB **white** level matching.

9. Film Type

This window serves to define the film type used.

Selection: Print Pos / Neg
Intermediate Pos / Neg
Primetime Pos / Neg
Color Pos / Neg

"Print Positive" used with print films, POS: negative inversion OFF

"Print Negative" used with print films, NEG: negative inversion ON

"Intermediate Pos" used with intermediate films, POS: neg. inversion OFF

"Intermediate Neg" used with intermediate films, NEG: neg. inversion ON

"Primetime Pos" used with primetime films, POS: neg. inversion OFF

"Primetime Neg" used with primetime films, NEG: negative inversion ON

"Color Positive" used with color films, POS: negative inversion OFF

"Color Negative" used with color films, NEG: negative inversion ON

Note!

Film types with orange mask are optically compensated.
Intermediate, Primetime and Color (POS or NEG) film types have different "orange mask compensations".

Print Pos or Neg

The "Print POS" selection creates an illumination spectral balance that, in conjunction with electronic masking or matrixing, will allow color reproduction of color print films approximating that achieved with optical projection.
The "Print NEG" selection creates an illumination spectral balance that allows scans of unmasked or b/w negative films.

Intermediate Pos or Neg

The "Intermediate POS or NEG" selection creates an illumination color spectral balance with sensitivity peaks that closely match the film dye density peaks of Eastman EXR Color Intermediate Film 5244. This mode of illumination also compensates for the red, green and blue minimum densities (D-min) caused by colored masking colored coupler found in the Eastman EXR Color Intermediate Film 5244 stock.

Primetime Pos or Neg

The "Primetime NEG" selection creates an illumination color spectral balance that is optimized for the characteristics of low-contrast Eastman Primetime negative film.
The "Primetime POS" selection creates an illumination color spectral balance to scan positive films with an orange mask close to prime time NEG films.

Color Pos or Neg

The "Primetime POS" selection creates an illumination color spectral balance to scan positive films with an orange mask close to prime time NEG films.

6/8 perf

Notes concerning 6/8 perf mode!

6/8 perf mode requires the options FH 1639 Vistavision and FH 1674 Rotation.

90° Rotation for 8perf

The vertical position of the 8 perf image requires a 90° rotation of the scanned image for the correct reproduction at the video outputs.

Vistavision & Cinerama

The selectable 6 / 8 perf standards are:

Vistavision[1] 8 perf 35mm film standard

Cinerama[1] 6 perf 35mm film standard

TV Standards H & V Resolution

6/8 perf mode operates in SDTV, (H)DTV[2] and Data[3] mode. The images are scanned in horizontal direction with approx. 1500 lines, the vertical resolution is based on1920 pixels.

Restrictions

Film speed restrictions
The maximum film speed for 6/8 perf mode is 30 fps fixed speed or 31.000 fps in SAS.

ACA LGA
The ACA Lens Gate Assembly is not supported in the 6/8 perf mode.

ACA Emulation
The ACA emulation is not supported in the 6/8 perf mode.

Markers
Markers are not supported in 6/8-perf mode.

Framing
Framing shifts the image horizontally.

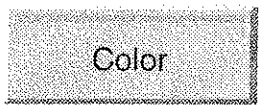
Resolution
The (H)DTV resolution in horizontal direction is limited to approx. 1500 lines due to the 90° rotated image scanning.

Editing Operation
The ballistic of the servo system in the filmdeck is changed for 6/8 perf mode. That means editing operation with the default telecine controller parameter is not accurate. (Pre-roll, stop etc.)
Please find out the new 6/8 perf setup parameter by testing the editing functions of your telecine controller in 6/8 perf mode.
Use alternatively he "default setup" or the "6/8 perf setup" parameters depending of the 2-4 perf or 6/8 perf mode.
(run-up time has been changed to approx. factor 2)

Perforation selection locked
Selecting of 2, 3, 4, 6 and 8 perf film scanning is only possible in STOP mode. Changing of perf selections - performed by the Functional Control Panel or telecine controllers - during PLAY, Shuttle, JOG etc. will be ignored.

1 Trademarks! All brands and product names are trademarks of their respective companies!
2 Requires Option DTV
3 Requires Option Phantom Transfer Engine TE2150

10. To switch **on** / **off** the color information.



"off" for black/white films
"on" for color films

4.4.2 SUBMENU "MASKING"

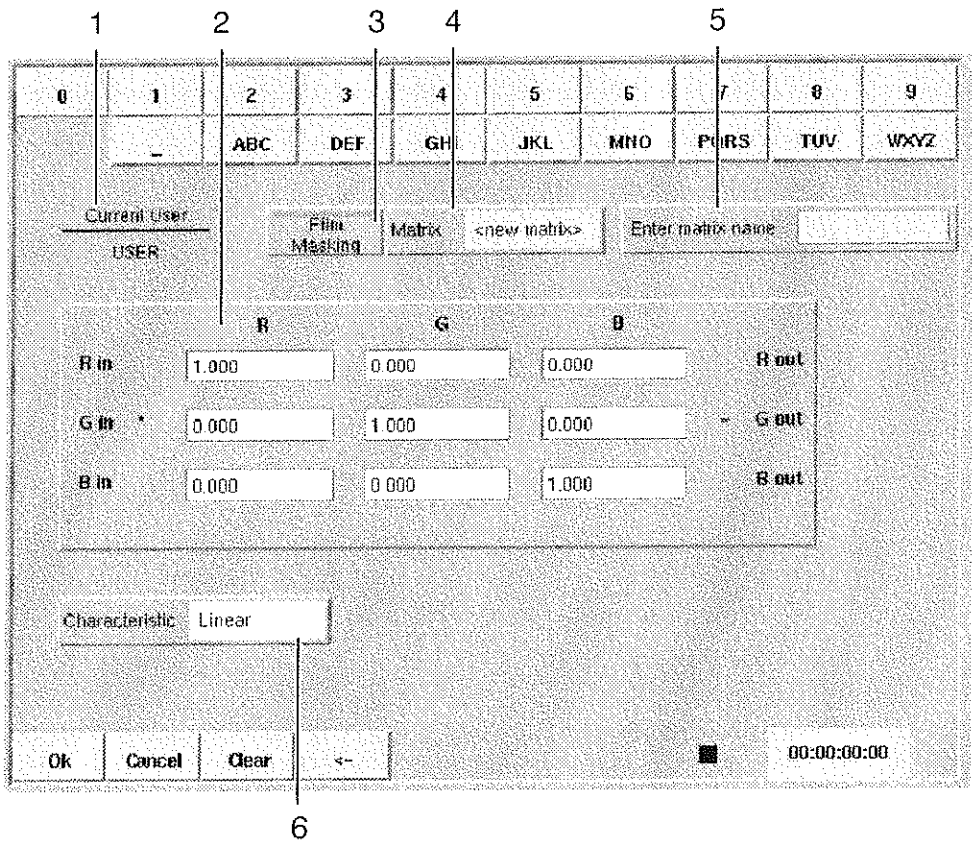


Fig. 406: Main menu **"Film"** / submenu **"Masking"**

Overview

The submenu "**Masking**" serves the color adaption to the actually used film. Adaption is made optionally by selection of fixed or variable masking coefficients. Print, intermediate, primetime and color films are adaptable (positive and negative films, see section 4.4.1 "Matching").

1. Current User, shows the selected user setup from menu TK Mems
2. R/G/B in * C1/9 = R/G/B out, represents the matrix equation

$$\begin{pmatrix} R\,in \\ G\,in \\ B\,in \end{pmatrix} * \begin{pmatrix} C1 & C2 & C3 \\ C4 & C5 & C6 \\ C7 & C8 & C9 \end{pmatrix} = \begin{pmatrix} R\,out \\ G\,out \\ B\,out \end{pmatrix}$$

3. Film Masking, to switch on / off the masking adjustment
4. Masking Mems, to select individual or fixed masking coefficients. Fixed masking coefficients, see next paragraph
5. Enter new Mem: to enter the name of new individual masking coefficients
6. Characteristic, to select "Linear" (mainly for correction of positive films) or "Logarithmic" (mainly for correction of negative films)

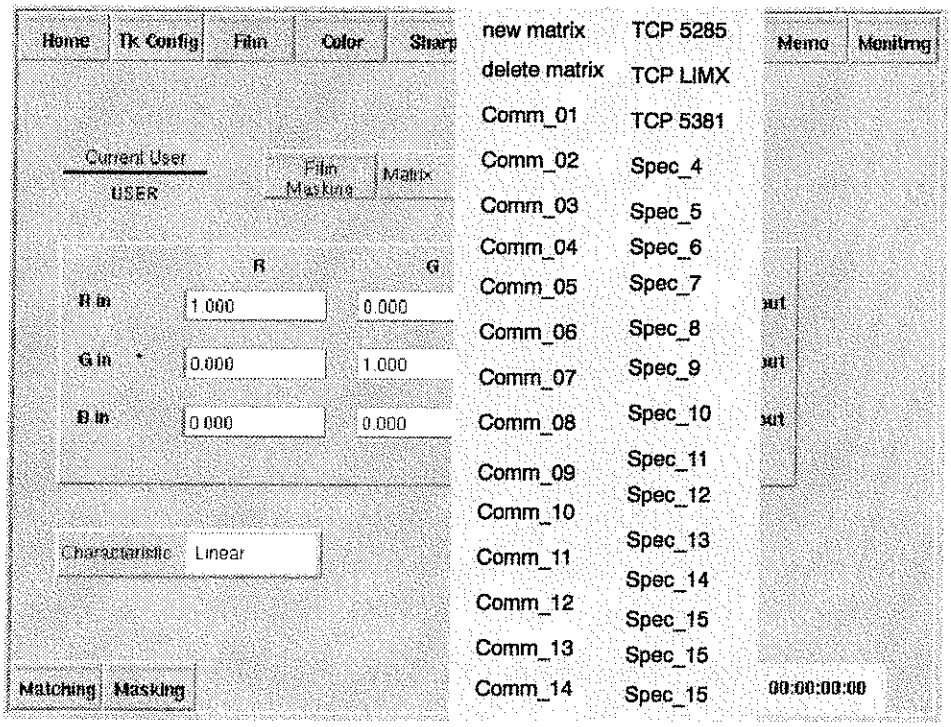
Fixed masking coefficients, see next paragraph.

Fixed sets of Coefficients

Various fixed sets of coefficients are available.
Depending from the selected Film Type (Illumination filter of the Filter wheel)

PRINT	**Print positive or negative**
COLOR	**Color positive or negative with orange mask**
PT	**Primetime negative with orange mask**
IMED	**Intermediate positive or negative**

example for film type Print pos or neg:



All fixed coefficients Special or Comm, see next two tables.

Select **Spec**(ial)
Selection of different film-dependent masking sets in the format:
XYYZZZZ (X = manufacturer, Y = film type, Z = film identification)
e.g.: KCN5247 = Kodak Color Negative 5247

X	**YY**
K = Kodak	CP = Color Print
G = Agfa	CN = Color Negative
F = Fuji	IM = Intermediate
T = Test	PT = Primetime

Fixed matrix types, selectable at SDC 2001 and depending on the film type selection:

Print		Intermediate		Primetime		Color	
Pos	**Neg**	**Pos**	**Neg**	**Pos**	**Neg**	**Pos**	**Neg**
TCP5285	-	TIM5244	-	-	TPT5600	-	TCNEXR1
TCPLIMX	-	KIM5244	-	-	TPN5600	-	TCN5279
TCP5381	-	TIP5244	-	-	-	-	-

Matrix coefficients, see next table:

Fixed masking - coefficients, 1, 3, 5, 8, and 9 for TAF (Telecine Analysis Film) optimized

Item	Matrix Name (Filter)	Masking Coefficient	Kodak Film Type
1	**TCNEXR1** (Filter Color)	**Color Negative TAF** log. masking R' = 0.90 R + 0.05 G + 0.05 B G' = 0.00 R 1.05 G - 0.05 B B' = 0.00 R 0.05 G + 0.95 B	5279
2*	**TCN5279** (Filter Color)	**Color Negativ TAF** log masking R' = 0.85 R + 0.05 G + 0.10 B G' = - 0.05 R 1.05 G - 0.00 B B' = 0.10 R - 0.20 G + 1.10 B	5279
3	**TPT5600** (Filter Primetime)	**Primetime Negative TAF** log. masking R' = 1.14 R - 0.13 G - 0.01 B G' = 0.00 R 1.04 G - 0.04 B B' = 0.04 R + 0.16 G + 0.80 B	5600
4*	**TPN5600** (Filter Primetime)	**Primetime Negativ TAF** log masking R' = 1.00 R - 0.03 G + 0.03 B G' = - 0.03 R 1.08 G - 0.05 B B' = 0.17 R 0.03 G + 0.80 B	5600
5	**KIM5244** (Filter Intermediate)	**Intermediate Positive Normal** log. masking (Not TAF, but film scenes optimized) R' = 1.05 R - 0.05 G 0.00 B G' = - 0.05 R + 1.10 G - 0.05 B B' = 0.02 R + 0.04 G + 0.94 B	5244
6*	**TIP5244** (Filter Intermediate)	**Intermediate Positive TAF** log masking R' = 0.92 R - 0.00 G + 0.08 B G' = -0.02 R + 1.00 G + 0.02 B B' = 0.12 R - 0.12 G + 1.00. B	5244
7	**TIM5244** (Filter Intermediate)	**Intermediate Positive TAF** log. masking R' = 0.94 R + 0.05 G + 0.01 B G' = 0.05 R + 1.09 G - 0.14 B B' = 0.02 R + 0.04 G + 0.94 B	5244
8	**TCP5285** (Filter Print)	**Print Low Contrast Positive TAF** log. masking R' = 1.00 R - 0.06 G + 0.06 B G' = - 0.05 R + 1.11 G - 0.06 B B' = 0.00 R - 0.08 G + 1.08 B	5285
9	**TCPLIMX** (Filter Print)	**Print Low Contrast Positive TAF** linear matrix R' = 0.98 R - 0.03 G + 0.05 B G' = - 0.05 R + 1.10 G - 0.05 B B' = 0.00 R - 0.05 G + 1.05 B	5285
10*	**TCP5381** (Filter Print)	**Print Positive TAF** log masking R' = 0.97 R - 0.02 G + 0.05 B G' = - 0.13 R +1.20 G - 0.07 B B' = 0.03 R - 0.15 G +1.12 G	5381

* = Masking coefficient exclusive for SDC 2001 and SDC 2000 scanners from serial no.: 200 onwards.

Masking

Masking switched off, the default masking coefficient is set to:

R'	=	1.00 R	0.00 G	0.00 B
G'	=	0.00 R	1.00 G	0.00 B
B'	=	0.00 R	0.00 G	1.00 B

Selection of different basic sets **"COMM"**:

Item	Matrix Name	Masking Coefficient			Film Type
0	Comm 0 = off	R' = 1.00 R G' = 0.00 R B' = 0.00 R	0.00 G 1.00 G 0.00 G	0.00 B 0.00 B 1.00 B	
1	Comm_1	log masking R' = +1.10 R G' = 0.00 R B' = 0.00 R	- 0.10 G 1.00 G 0.00 G	0.00 B 0.00 B 1.00 B	
2	Comm_2	log masking R' = + 1.10 R G' = 0.00 R B' = 0.00 R	0.00 G 1.00 G 0.00 G	- 0.01 B 0.00 B 1.00 B	
3	Comm_3	log masking R' = 1.00 R G' = 0.00 R B' = 0.00 R	0.00 G + 1.10 G 0.00 G	0.00 B - 0.10 B 1.00 B	
4	Comm_4	log masking R' = 1.00 R G' = 0.00 R B' = 0.00 R	0.00 G + 1.10 G - 0.10G	0.00 B - 0.10 B + 1.10 B	
5	Comm_5	log masking R' = + 1.10 R G' = 0.00 R B' = 0.00 R	- 0.10 G + 1.10 G 0.00 G	0.00 B - 0.10 B + 1.00 B	
6	Comm_6	log masking R' = +1.10 R G' = 0.00 R B' = 0.00 R	- 0.10 G + 1.10 G - 0.10 G	0.00 B - 0.10 B + 1.10 B	
7	Comm_7	log masking R' = +1.10 R G' = 0.00 R B' = 0.00 R	- 0.10 G 1.00 G - 0.10 G	0.00 B 0.00 B + 1.10 B	
8	Comm_8	log masking R' = +1.10 R G' = 0.00 R B' = 0.00 R	0.00 G 1.10 G - 0.01 G	- 0.10 B - 0.10 B + 1.10 B	
9	Comm_9	lin masking R' = +1.10 R G' = 0.00 R B' = 0.00 R	- 0.10 G 1.00 G 0.00 G	0.00 B 0.00 B 1.00 B	
10	Comm_10	lin masking R' = + 1.10 R G' = 0.00 R B' = 0.00 R	0.00 G 1.00 G 0.00 G	- 0.01 B 0.00 B 1.00 B	

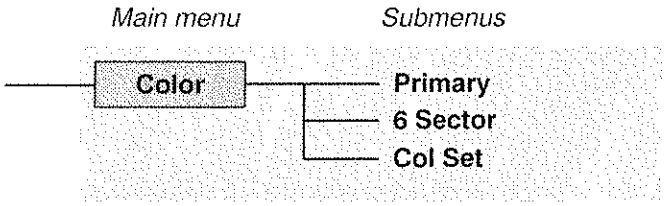
11	Comm_11	**lin masking** R' = 1.00 R 0.00 G 0.00 B G' = 0.00 R + 1.10 G - 0.10 B B' = 0.00 R 0.00 G 1.00 B	
12	Comm_12	**lin masking** R' = 1.00 R 0.00 G 0.00 B G' = 0.00 R + 1.10 G - 0.10 B B' = 0.00 R - 0.10G + 1.10 B	
13	Comm_13	**lin masking** R' = + 1.10 R - 0.10 G 0.00 B G' = 0.00 R + 1.10 G - 0.10 B B' = 0.00 R 0.00 G + 1.00 B	
14	Comm_14	**lin masking** R' = +1.10 R - 0.10 G 0.00 B G' = 0.00 R + 1.10 G - 0.10 B B' = 0.00 R - 0.10 G + 1.10 B	
15	Comm_15	**lin masking** R' = +1.10 R - 0.10 G 0.00 B G' = 0.00 R 1.00 G 0.00 B B' = 0.00 R - 0.10 G + 1.10 B	
16	Comm_16	**lin masking** R' = +1.10 R 0.00 G - 0.10 B G' = 0.00 R 1.10 G - 0.10 B B' = 0.00 R - 0.01 G + 1.10 B	

Characteristic

Mode **Linear** is mainly used when correcting **positive** films (projection-related correction).

Mode **Logarithmic** is mainly used when correcting **negative** films (scene-related correction).

4.5 COLOR MENU



4.5.1 SUBMENU PRIMARY

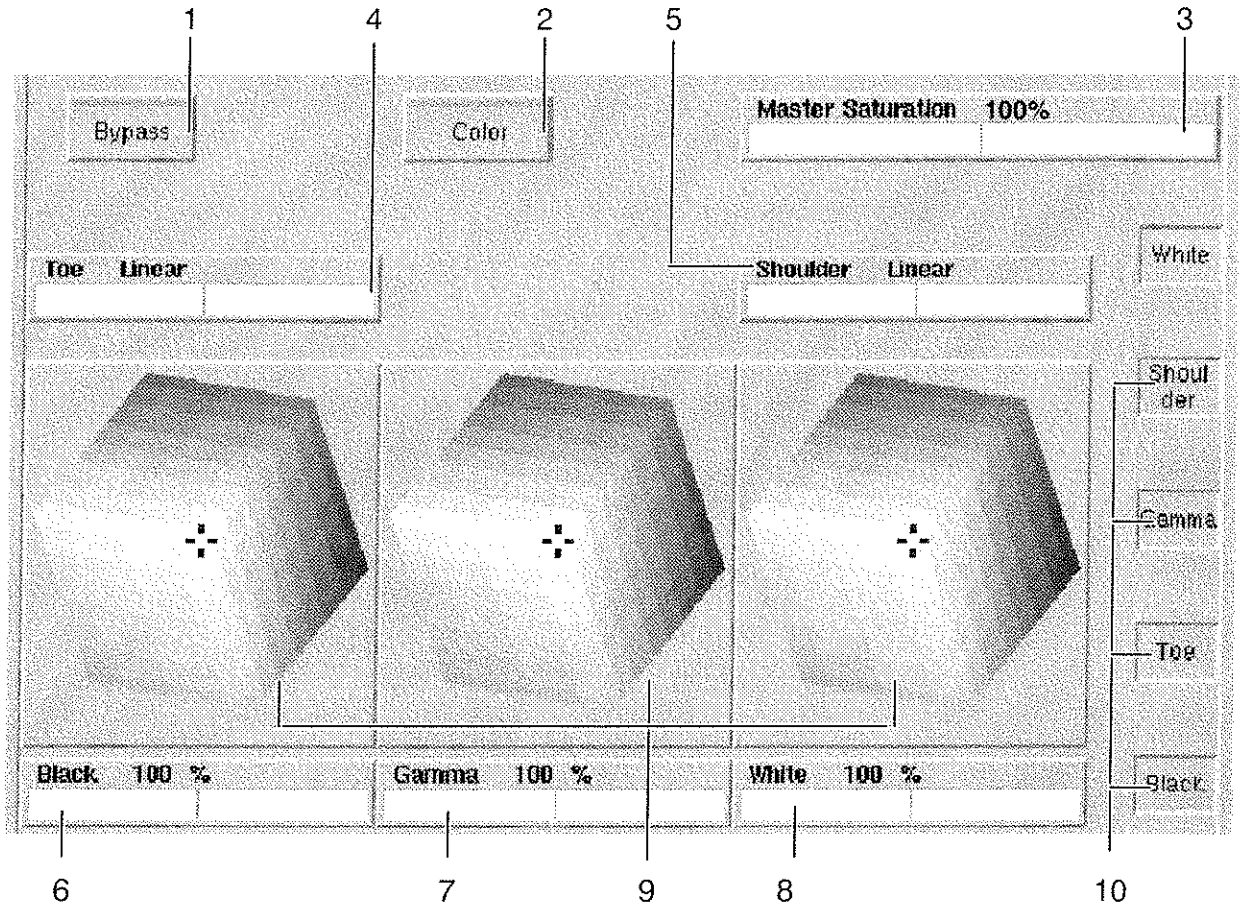


Fig. 407: Main menu **"Color"**, submenu Primary

Overview

The sub menu "Primary" provides primary color grading functions.

1. Button "Bypass" switches the DataCine's Primary Color Correction on / off

2. The Color button switches the video signal processing from color to monochrome mode

3. Slider "Master Saturation" controls the overall color saturation

4. Slider "Toe" stretches or compresses the gamma curve in the black / dark parts of the picture

5. Slider "Shoulder" stretches or compresses the gamma curve of the withe / light parts of the picture

6. Master "Black" controls the dark parts of the picture

7. Master "Gamma" controls the mid-tones of the picture

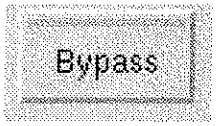
8. Master "White" controls the light parts of the picture

9. RGB Black, RGB Gamma and RGB White changes the color balance of the picture

10. Designations of the digipot controls

Function Buttons, Controls & Displays

1.



Button "Bypass" switches the Primary Color Correction on / off.

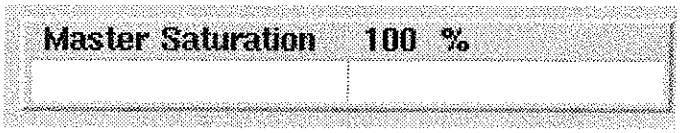
For images which should not be affected by the Telecine's Primary Color Correction the BYPASS key must be switched on.
BYPASS is enabled when the bar on the button is yellow.

2.

To switch **on** / **off** the color information.

"off"	for black/white films
"on"	for color films

3. Master Saturation



This key controls the overall color saturation.

It works in both directions: you can **desaturate or enhance saturation.**

The default value is 100%.

To operate, use the digipot control or slide directly on the touchscreen.

4. Toe Linear

This function stretches or compresses the gamma curve in the blacks/dark parts of the picture.

There are 5 positions available:

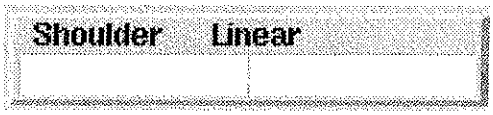
High Compression, Low Compression, Linear, Low Stretch, High Stretch.
Linear is the default.

To operate, use the corresponding digipot or slide directly on the touchscreen.

Apply low or high compression to easily achieve "print look" when working with negative film.

Use low or high stretch to brighten up the blacks when working with high contrast Prints.

5. Shoulder



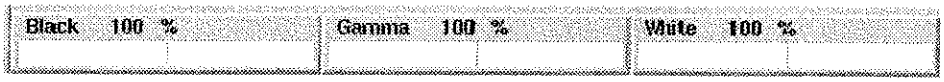
This function stretches or compresses the gamma curve in the whites/light parts of the picture.

There are 5 positions available:
High Compression, Low Compression, Linear, Low Stretch, High Stretch.

Linear is the default.

To operate use the corresponding digipot or slide directly on the touchscreen.
Apply low or high stretch to bring down the lights of a steep Print.
Use low or high compression to brighten up the lights of a flat material.

Master
6. Black
7. Gamma
8. White



Master BLACK controls the dark parts of the picture.

Master GAMMA controls the mid-tones of the picture.

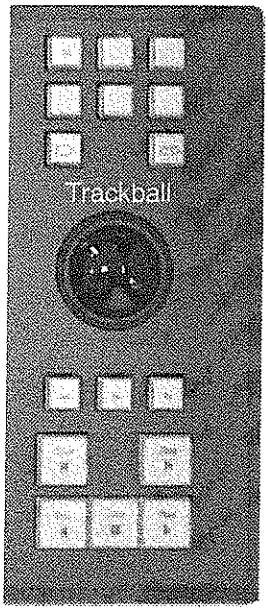
Master WHITE controls the light parts of the picture.

The combination of these controls and especially bringing GAMMA up or down makes the picture look softer or harder in contrast.

To operate, use the corresponding digipot or slide directly on the touchscreen.

9. RGB Black Gamma White

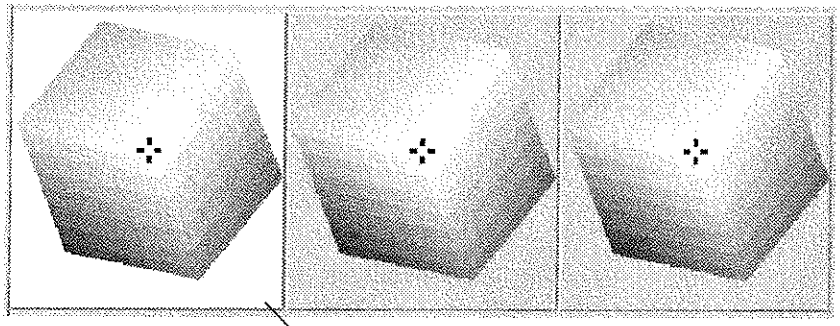
These controls are used to change the color balance in the **Black**, **White** and **Gamma** (mid-tone) parts of the picture.



There are two ways of operating: Take a pencil (or your finger) and slide directly on the colored hexagon of the touchscreen.

The more comfortable way is to use the trackball. By clicking on the area around the hexagon, the control is delegated to the trackball.

The currently active control (Black, Gamma or White) is then highlighted. The cursor inside the hexagon indicates the working position.



Highlighted active control delegated to the trackball

4.5.2 SUBMENU 6 SECTOR COLOR

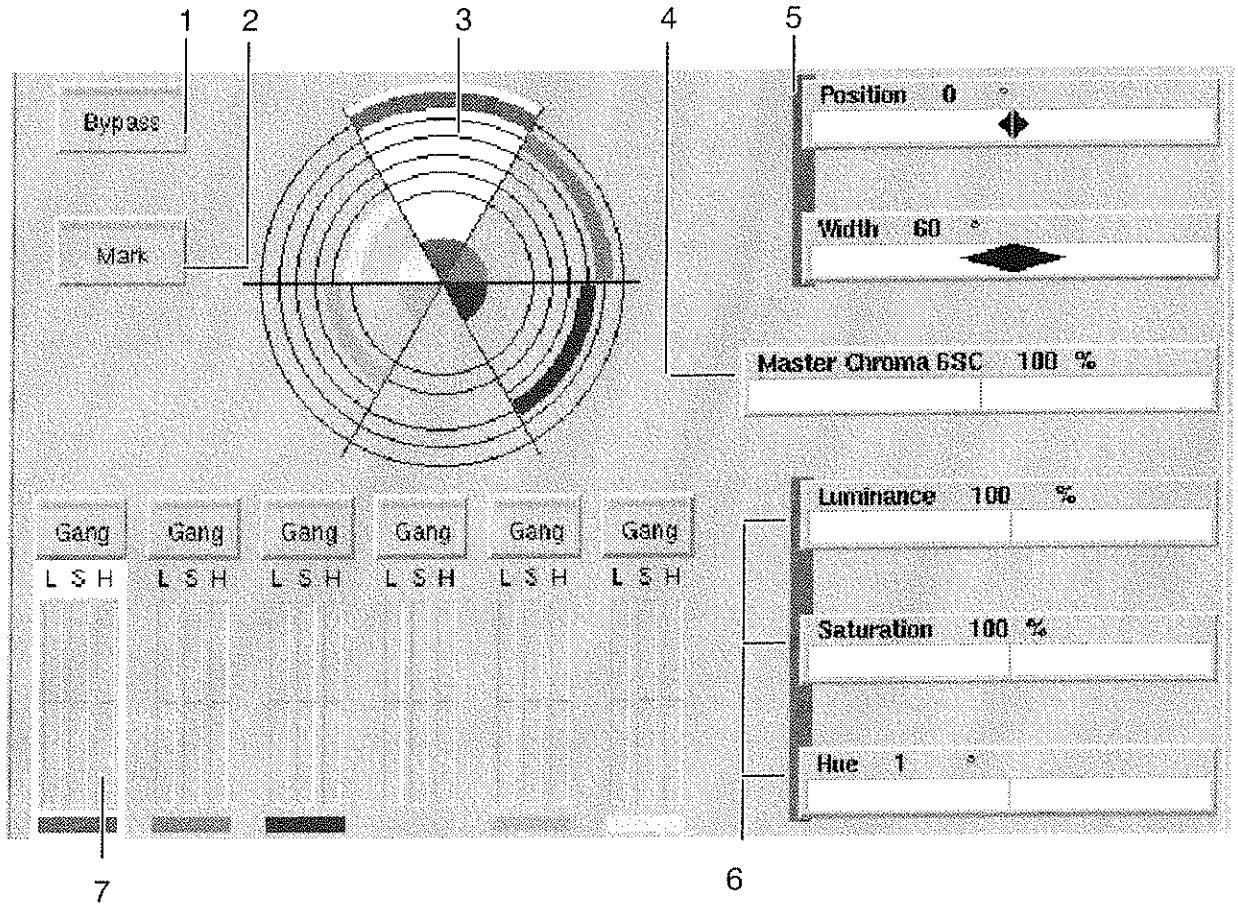


Fig. 408: Main menu **"Color"**, submenu 6 - Sector

Overview

This submenu allows a selective color correction based on six color sectors:

Red, Green, Blue, Yellow, Cyan and Magenta.

1. Button Bypass switches the secondary color correction on / off
2. Mark key separates a certain color value in solochrome or flashing mode
3. Qualifying scheme and display of the color circle with six color sections
4. Master Chroma 6SC serves for global color saturation
5. Position & Width alter hue and the angle of the selected color
6. Luminance, saturation and hue sliders modify the selected color
7. Qualifying scheme an display of luminance, saturation and hue values for the selected color

All modifications are weighted with the saturation to avoid noise increase for low saturated objects.

To perform a smooth transition between modified colors, each sector has a center hue where all modifications will apply 100%, and a symmetric width with a linear decrease of the modifications towards zero at the sector boundaries.

To allow a creative color makeup the center position and the sector width can be modified individually for any of the six sectors, to select a particular color or color range that is intended to the modified or altered.

Each sector allows altering of luminance saturation and hue for the sectors selected color range.
Details of 6SC Processor, see next chapter 4.5.3.

4.5.3 Description of 6 Sector Processor

Primary Color Corrector

Thomson film scanning solutions are provided with a standard primary color corrector (RGB) which offers extensive range and latitude combined with precise digital control.
This correction is real-time and resolution-independent, up to 2K. So correction for any output format is supported, even data, with transparent switching between the formats.

Secondary Color Corrector

There are applications where the basic primary functionality need be enhanced with basic secondary color control, the 6SC Processor.
This option is a cost-effective solution designed to be used with a controller only, or to enhance the features offered by third party color correctors available on the market today.
Dailies, best light transfers and the growing adoption of downstream disk-based color correction systems require a high-quality basic grade before the finishing touches are applied downstream.
Just like the primary color correction system, the secondary color corrector is real-time, resolution-independent and working with the full film color space and at full film resolution.

Features

The basic secondary color processor extends the primary color corrector already supplied with Thomson film scanners and vastly increases the functionality and flexibility of the basic telecine system.

Controls:

Selected colors can be changed in **luminance**, **saturation** and **hue** across a wide range.

Color
Position
Width
Saturation
Hue

The qualification of the selected color is defined by hue, with six independently applicable sectors: **red**, **yellow**, **green**, **cyan**, **blue** and **magenta**.

Luminance

To increase creative latitude we also refine the qualification of the color by adjustment of the **position** and **width** of each sector. Also provided is a **master saturation control**.

6SC Limiter
S100-S108
H100-H108

Another very powerful feature within this option is a **limiter** and **color legalizer**.
The limiter works in the luminance channel and can be switched between hard and soft clipping.
The legalizer (illegal colors) is switchable (on / off) and works in the chrominance channel.

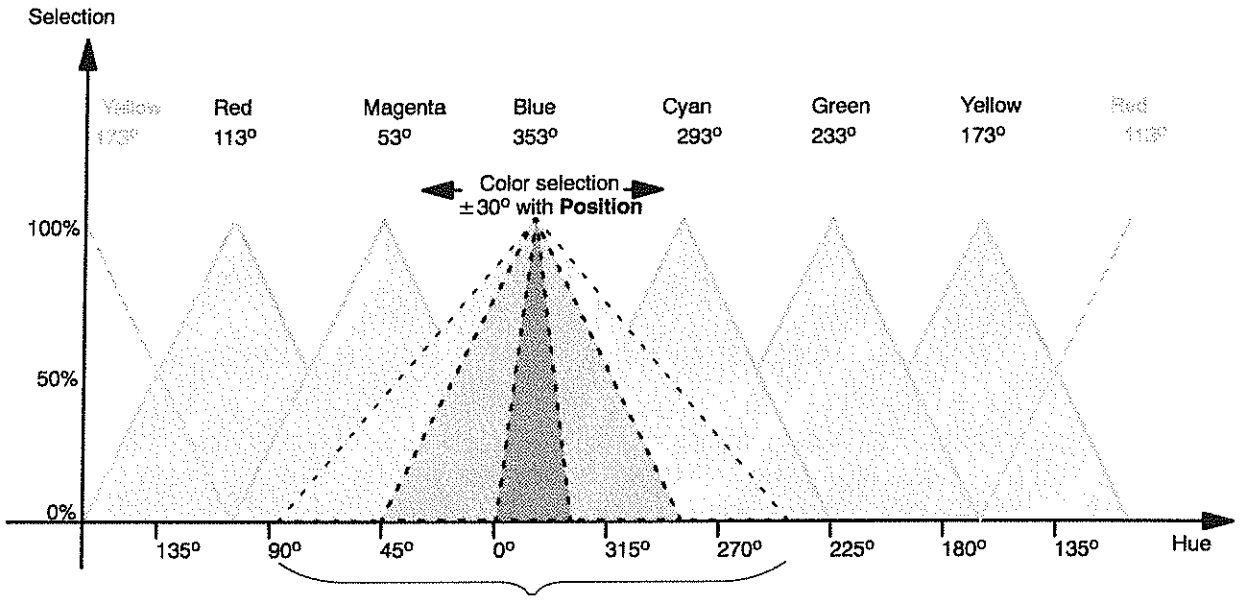
Color Legalizer avoids illegal colors

The color tint (hue) is always maintained but the saturation is reduced in that particular picture element.
The RGB output stage of the telecine and these features are an innovative way to maintain creative latitude and also ensure that within legal color ranges, the user is making possible the use of highly saturated colors without having to worry about illegal colors.

Color Selection - Position & Width

- "Position" applies to the color selection within a range of ± 30°
- "Width" adjusts the color range from 10° to 230°, default 120°

Selection = Application of modification parameters (lum / sat / hue) for a pixel with a given hue



All modifications are weighted with the saturation to avoid noise increase for low-saturated objects.

Fig. 409: Color selection

Color Modification - Luminance, Saturation & Hue

Luminance

- "Luminance" has an effect on the luminance amplitude within a range of 0 - 400%

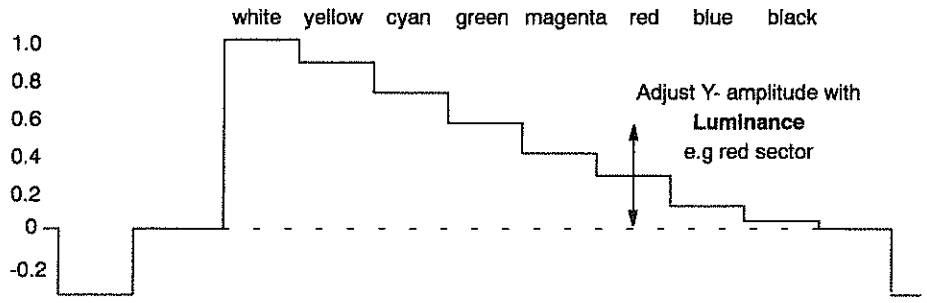


Fig. 410: Luminance signal

Hue and saturation in vector display

- "Hue" changes a center color within a range of ± 180° of a color circle
- "Saturation" changes the selected color gain from 0% - 200%

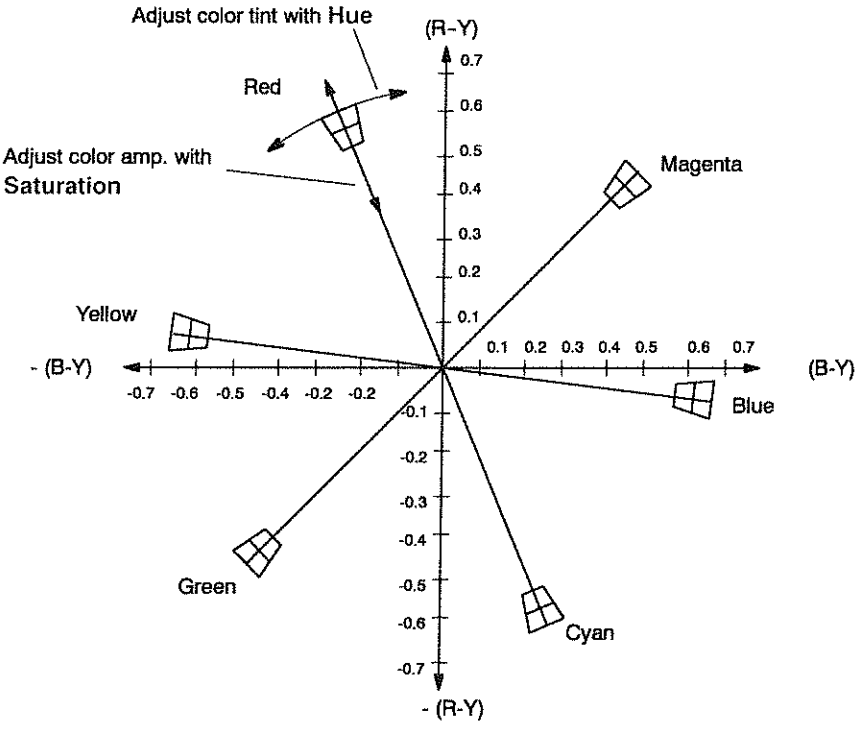


Fig. 411: Color circle

Using the 2 Controls:

Note!
With the option 6SC Processor an additional saturation (chroma) control is provided. Using this saturation adjustment avoid illegal colors.

Master Chroma 6SC and Saturation

It is recommended to set color saturation - menu Color - Master Saturation - in middle position!

Limiter Luminance & Chrominance

6SC Limiter Luminance
S100 - S108 soft limited / H100 - H108 hard limited

- 6SC limiter terminates the RGB amplitude and RGB luminance range from 100% to 108% with a soft (knee) or a hard (clipped) characteristic.
  See example below for a red sawtooth signal.

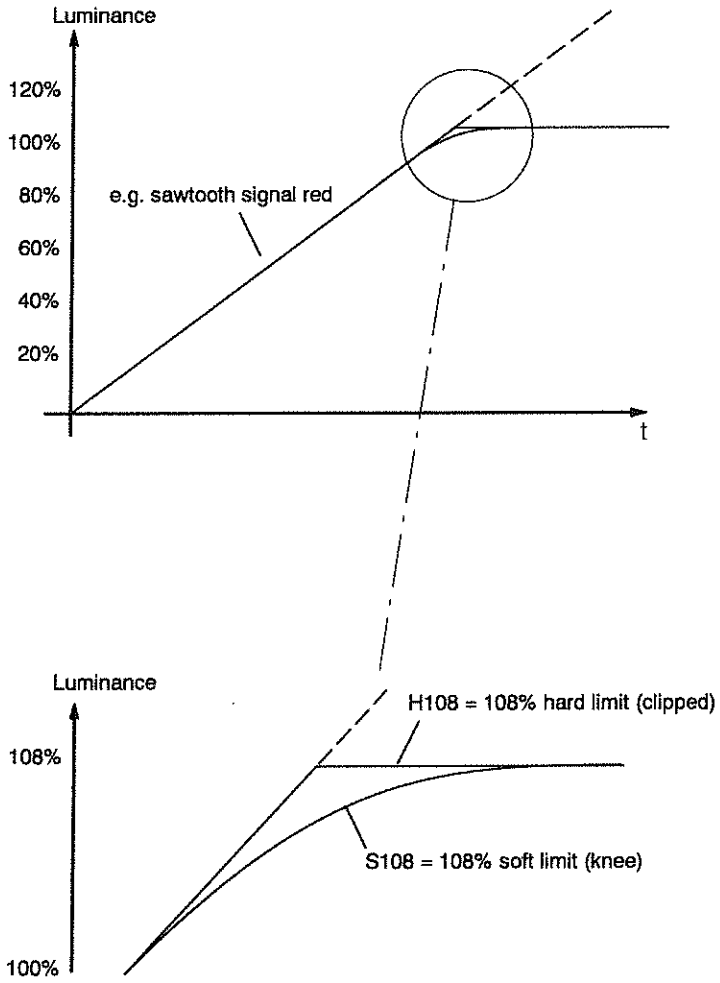


Fig. 412: 6-SC limiter

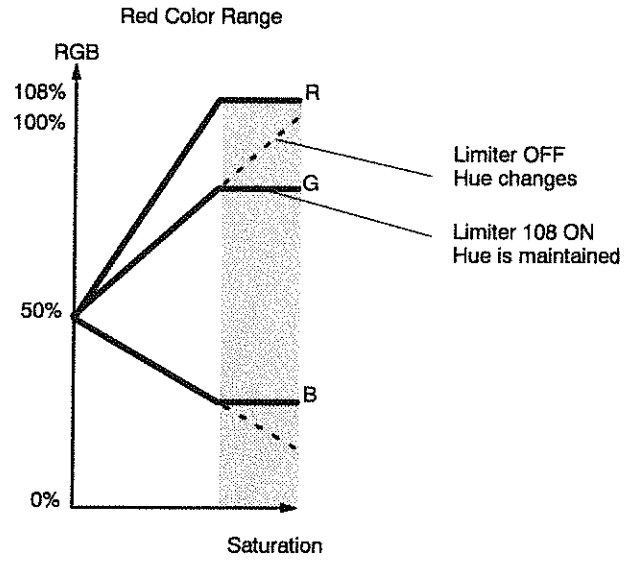
6SC Limiter - Chrominance & Saturation

- 6-SC limiter "S 100 - 108" or "H 100 - 108" terminates the RGB amplitude of a selected color in a range of 100 - 108 %. Examples, see below.

Example 1

Limiter 108 ON

Hue is maintained
for a red color signal
where Red is clipped at 108%
and Green / Blue do no longer change



Example 2

Limiter 108 ON

Hue is maintained
for a red color signal
where Blue is clipped at 0%
and Red / Green do no longer change

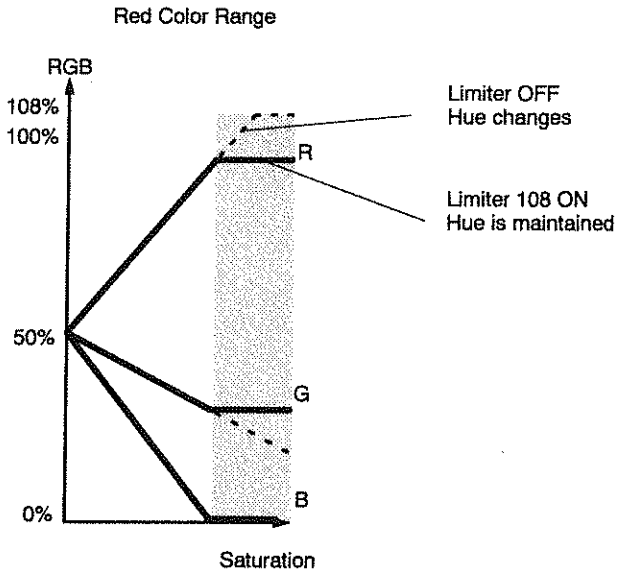


Fig. 413: 6-SC Limiter

When performing modifications of luminance and saturation, one component of the RGB signal may reach the border of the allowed signal range and has to be limited.

To avoid a hue change from individual unit of R, G or B, the legalizer will limit **all** components of the RGB signal if one component R, G or B reaches the selected border of the allowed range.

Operational Control

Operational control is provided via the popular controllers from DaVinci and Pandora. Thomson also supports full control from the graphical control panels supplied with the Spirit DataCine. No additional cables are required, all control functions are embedded within the existing IMCS Cheapernet (10baseT) control interface currently used on these products.

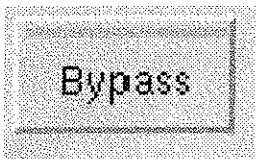
System Integration

The secondary color processing option 6SC fits seamlessly into the internal processing and rack structure of the Spirit DataCine. This option is available for any Spirit DataCine SDC 2000/2001 previously delivered. Two 6SC boards are required for the Spirit DataCine SDC 2001.

Technology

The design and implementation is 100% digital, and fits seamlessly into our high speed digital signal processing architecture. It uses up to 16-bit quantization and operates in real time at up to 2K resolutions. When in unity mode, there is complete transparency through the system.

Function Buttons, Controls & Displays - 6 Sector Color



Button "Bypass" switches the secondary Color Correction 6SC on / off.

For images which should not be affected by the 6SC, the BYPASS key must be switched on.

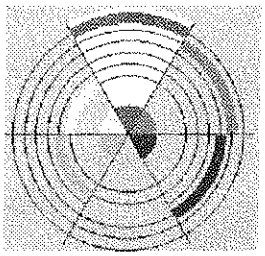
BYPASS is enabled when the bar on the button is yellow.

This feature separates a certain color which later on can be altered with the MODIFYING KEYS of the 6 Sector Color Correction.

Different setups (flashing or solochrome) for the 6SC COLOR MARKER can be selected on the next submenu "Col Set".

Click on the key to activate the MARK function (enabled when the bar on the key is yellow).

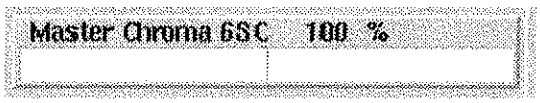
Qualifying Scheme Color Circle 6SC



The color circle, one part of the qualifying scheme, serves for selection the color and to display its position and width.

The currently chosen sector is highlighted.

Master Chroma 6SC



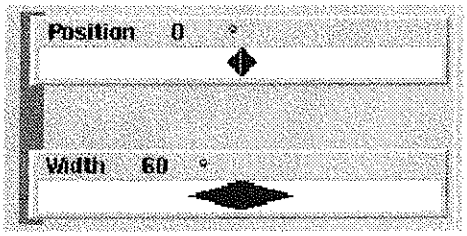
This is a saturation control affecting all sectors in the same way.

It is different from the saturation control in the COLOR PRIMARY MENU as it is located on the secondary 6SC Correction board.

To operate, move the slider on the touchscreen or use the digipot control.

MASTER CHROMA ranges from 0 to 200%, the default value is 100%.

Position & Width



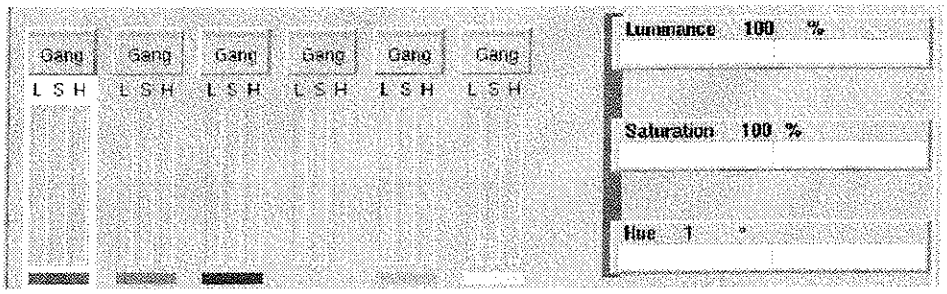
POSITION
alters the hue, e.g. if the red you want to modify is rather on the purple-tinted or on the orange-tinted side.
To operate, move the slider on the touchscreen or use the digipot control.
POSITION ranges from -30° to +30°, default is 0°.
The current position is displayed on the qualifying scheme.

WIDTH
defines the angle, i.e. the range of tints that will be affected by the modification.

Big width represents a broad angle, a bigger section of e.g. red tones will be affected, small width represents a thin angle, only few red tones will be affected.
To operate, move the slider on the touchscreen or use the digipot control.

WIDTH ranges from 10 to 230 degrees, the default value is 60 degrees. The current angle is displayed on the qualifying scheme.

Luminance Saturation Hue



MODIFYING BAR GRAPHS AND MODIFYING KEYS

Once the qualifying is done, the separated color areas can be modified by changing HUE, SATURATION and/or LUMINANCE.

To operate, move the slider on the touchscreen or use the corresponding digipot control.

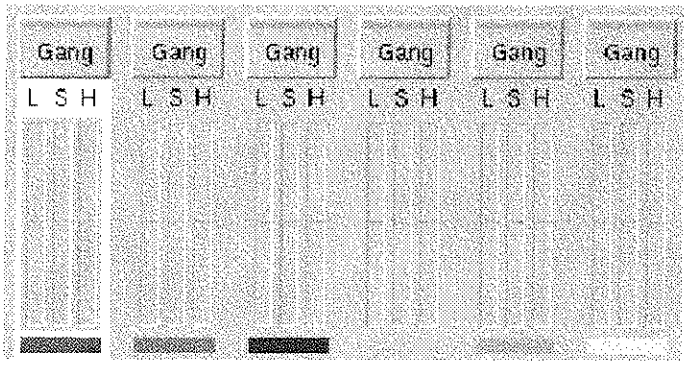
LUMINANCE and SATURATION range from 0 to 200%, default is 100%.

The HUE range is +/-180°.

The LSH modifications are visible in the BAR GRAPH display.

The graph which belongs to the activated sector is highlighted and the colorbar of the MODIFYING KEYS shows the corresponding color.

Qualifying Scheme



This scheme in conjunction with the MARK function serves to separate (to qualify) the color which shall be modified.

Enable the MARK function and select the COLOR SECTOR which comes closest by clicking on it.
The currently chosen sector is highlighted and the bars of the QUALIFYING and MODIFYING KEYS show the corresponding color.
In dependence of the selected MARK SETUP (Col Set Menu) parts of the picture (on your picture monitor) get in some way highlighted.There are 2 settings available: SOLOCHROME and FLASHING.

4.5.4 SUBMENU COLOR SET

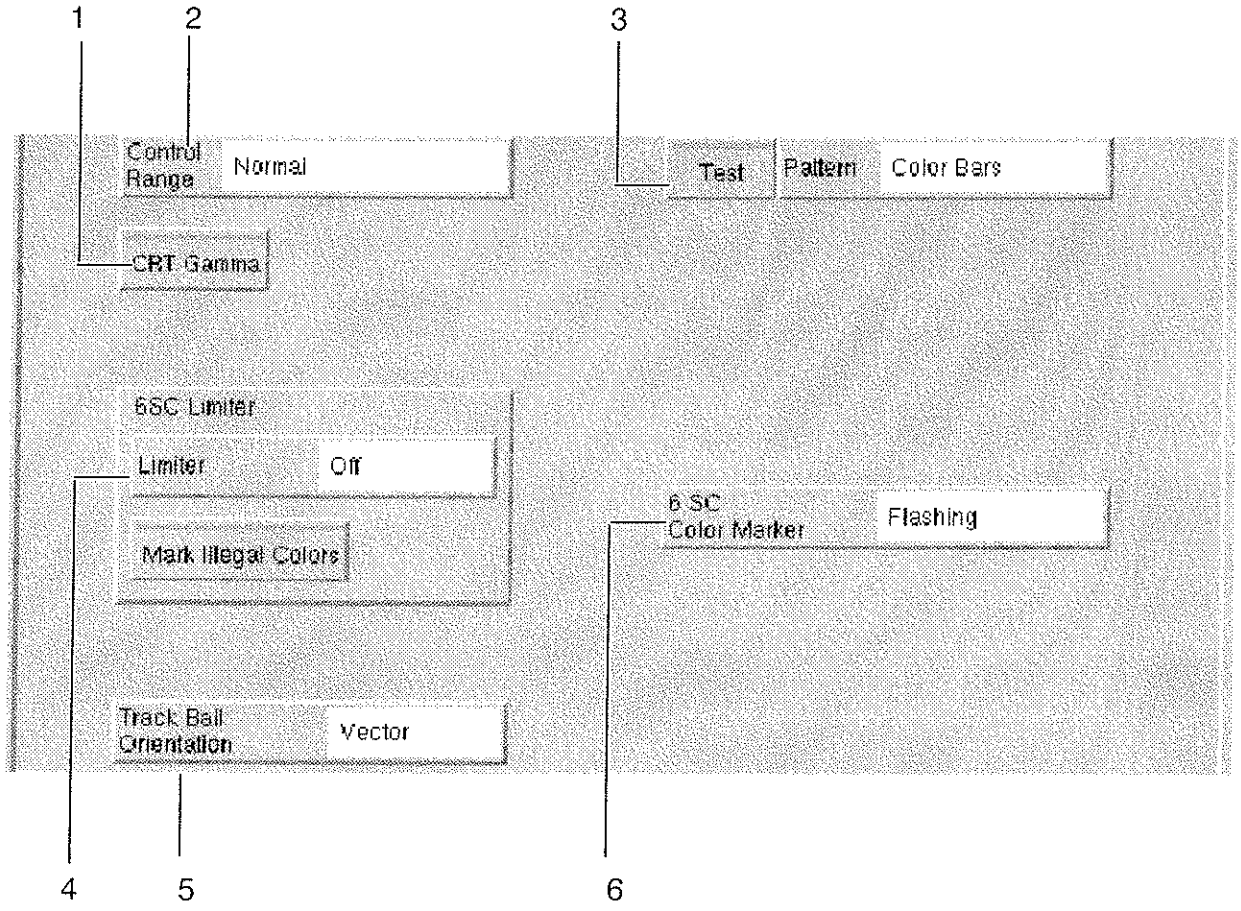


Fig. 414: Submenu Color Set

Overview

This menu provides various setups related to color grading

1. CRT Gamma pre-equalization compensates the CRT characteristic of a display monitor
2. Control Range switches the range of the primary color correction parameters from normal to extended
3. Test - Test Pattern provides an amount of helpful test signals for monitoring the signal processing
4. 6SC Limiter provides a built -in legalizing for RGB signals
5. Trackball Orientation refers to the DELTA Controls (hexagons) of the color primary menu (color display: vector scope like or MK III 120° cw rotated)
6. 6SC Color Marker separates a certain color by displaying solochrome or flashing the selected color

Details of Function Buttons, Controls & Displays - Col Set

1. CRT Gamma

CRT is a gamma function to compensate the gamma of a picture monitor.

In order to judge a picture content (in terms of gradation) by looking at a monitor, CRT has to be switched on.

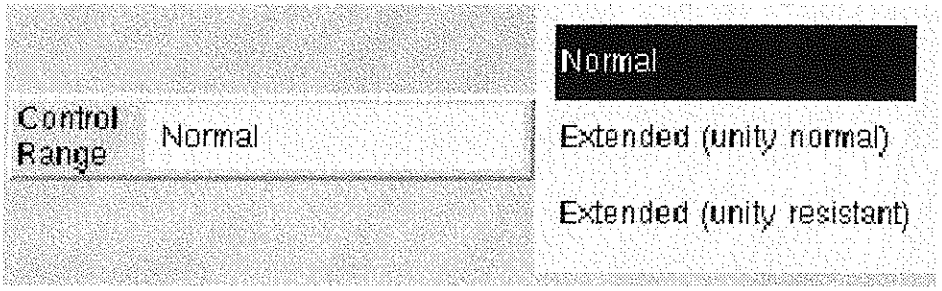
When working with Data, the end product is not necessarily video or a TV picture but a picture recorded back on film or a picture which will be projected by a video beamer. In this case, a Output LUT (lookup table) will be chosen that replaces the CRT gamma by its own characteristic.

Depending on the selected Output LUT, CRT GAMMA will automatically be switched on or off.

Note! CRT GAMMA in Data mode is only active with TVLEV and GRLEV.

When CRT Gamma is active, the green bar on the button is lit.

2. Control Range



This button switches the range of Black, RGB Black, Gamma, RGB Gamma, WHITE and RGB White from Normal to Extended Range.

Pressing Unity leads to different values in Extended Range mode compared to Normal mode.

In Extended Ranges mode, Master Gamma changes can affect the Blacks and Whites in your picture, whereas in Normal mode only the gray tones are addressed.

Therefore adjust Gamma first, then do BLACK (Lift) and WHITE (Gain).

Changing from Normal to Extended Ranges within a programmed list requires re-adjustment of Black, Gamma and White.

Dependent on the grading, Extended Ranges may increase noise.

"Ranges"

Parameter for the ranges of the primary color correction, see also chapter 4.5.5

Selection: **Normal** / Extended (unity normal) / Extended (unity resistant)

"Normal"	standard values of the primary color correction
"Extended (unity normal)"	extended ranges for the primary color correction; unity normal
"Extended (unity resistant)"	extended ranges for the primary color correction; unity resistant

Control Range

"Toe"

High black **compression**: e.g. 20% level changes to 5%
Low black **compression**: e.g. 20% level changes to 12%
Linear level, no changes
Low black **stretch**: e.g. 20% level changes to 28%
High black **stretch**: e.g. 20% level changes to 35%

"Shoulder"
High white **compression**: e.g. 80% level changes to 95%
Low white **compression**: e.g. 80% level changes to 88%
Linear white, no changes
Low white **stretch**: e.g. 80% level changes to 70%
High white **stretch**: e.g. 80% level changes to 61%

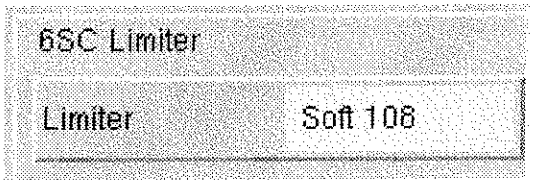
3. Test & Pattern

When Test is enabled, the yellow bar on the key is lit.

By pressing the adjacent pattern key, a drop-down menu opens, containing all available Test Patterns.
To select a pattern, click on it.
The current selection is shown on the key display. If it reads "HDNR Pattern", a SCREAM Test Pattern is active.

This function is redundant in the Monitoring and in the Home Menu.

4. 6SC Limiter



There are 6 different limiter settings available:

Soft 108, Hard 108, Soft 102, Hard 102, Soft 100, Hard 100.

"Soft" implies smooth limiting (a knee function is applied),
"Hard" stands for signal clipping.

Value "100" limits RGB range between 0% and 100%,
value "102" limits RGB range between 0% and 102%,
value "108" limits RGB range between -7% and 108%.

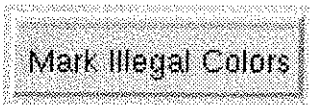
"Off" stands for no limitation.Click on the key and make your choice from the drop-down menu.

Note that this limiter only affects the signal output of the 6SC Board.

This is not identical to the output signal of the telecine as the RGB signal coming from the 6SC Board is processed further on.

Details, see also chapter 4.5.3 "Description of 6SC"

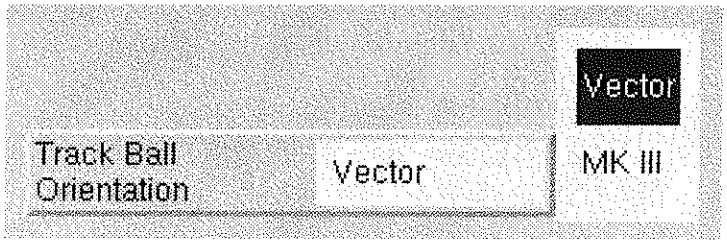
Mark Illegal Colors



If enabled (the green bar on the key is lit) all illegal colors according to the selected limiter mode will be highlighted by an inverted luminance signal.

Note that in case the 6SC Limiter is switched to "Off", this key has no function.

5. Trackball Orientation

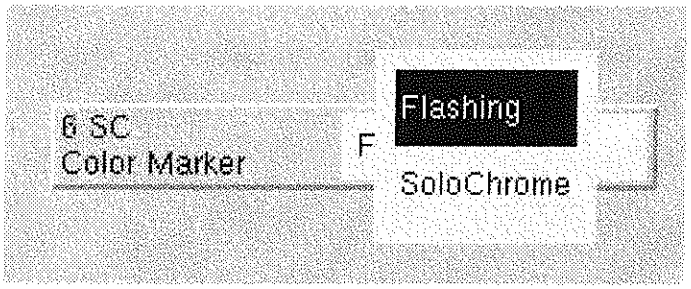


This button refers to the DELTA Controls (Hexagons) of the Color Primary Menu.

The trackball orientation can be switched between VECTOR which means vectorscope like orientation and MK III.

MK III is derived from Rank Mark III machines and it rotates the orientation clockwise through 120° relative to the vectorscope display.

6. 6 SC Color Marker



This menu page contains the 6SC Color Marker Setup. You find the switches to enable the MARKER on the Color/6SC menu.

This feature in conjunction with the QUALIFYING SCHEME makes it easy to separate a certain color which later on can be altered with the MODIFYING KEYS of the 6 Sector Color Correction.

There are 2 settings available:

Solochrome and Flashing. With **Solochrome** enabled only the selected color is visible in the picture.
E.g. select the blue sector in the 6SC menu and the only visible color in the picture is blue. The colors corresponding to the other 5 sectors are desaturated.
Now use the POSITION and WIDTH keys in order to refine the color separation within the blue sector.

With **Flashing** enabled the luminance part of the selected color is alternately switched from 0% to 100% (which results in flashing).

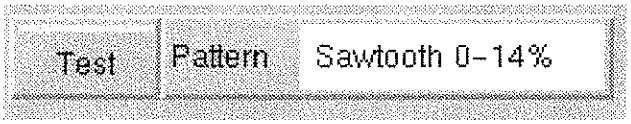
Click on the key and -according to your preferences- choose from the drop down menu. The current selection is shown on the key display.

4.5.5 EXTENDED COLOR CORRECTION RANGES

Test & Operating Sequence

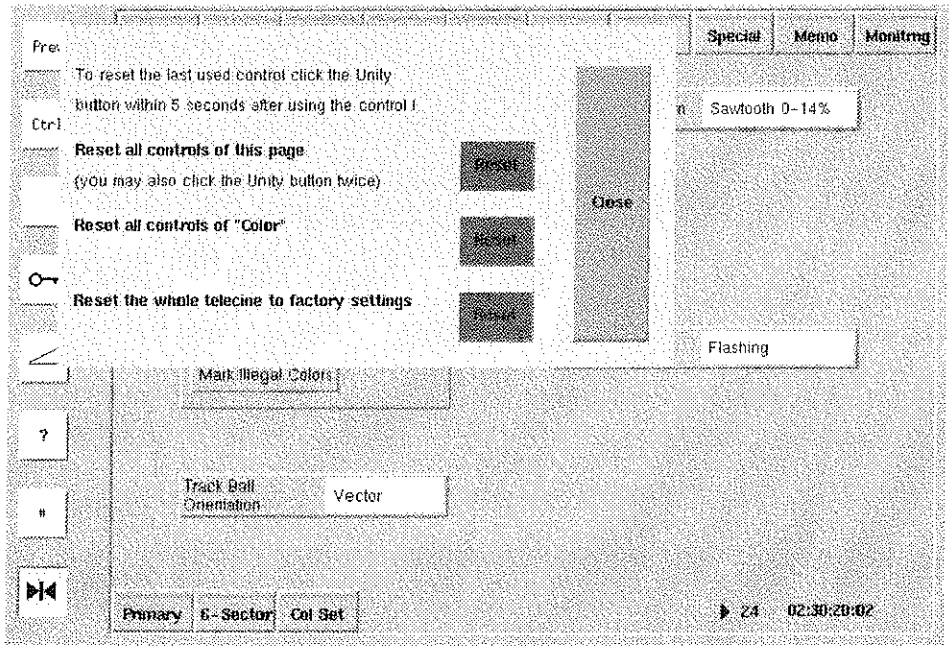
Select test signal Sawtooth

1. For testing, select menu Color, submenu Col Set
2. Press Pattern
3. Choose test signal **Sawtooth 0-14%**
4. Press Test button for activate the test signal



Set Unity

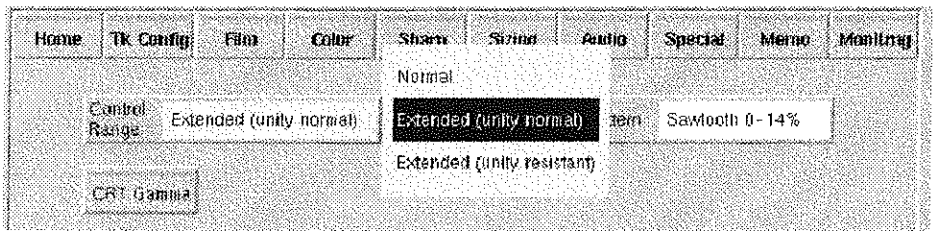
5. Set all color parameter to **unity**



Select Ext. Ranges

6. Set Control Range to "Extended (Unity normal"
   or
   Set Control Range to "Extended (Unity resistant!"

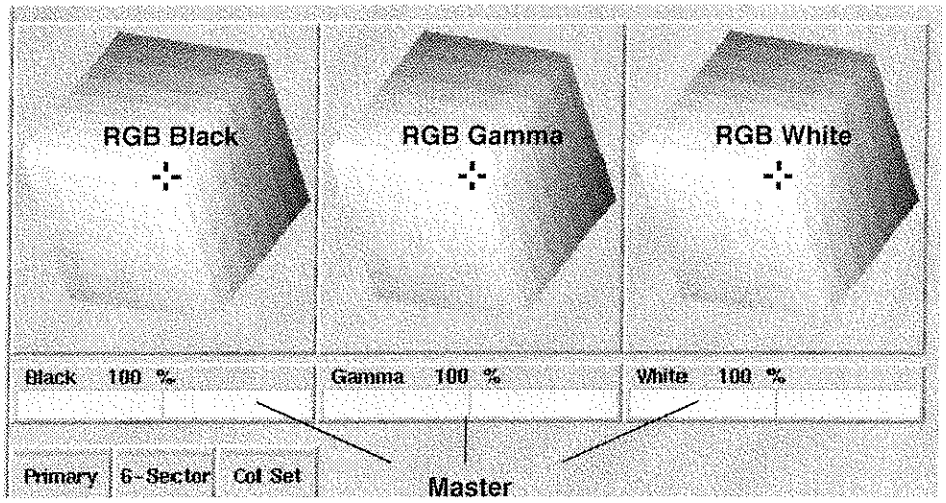
   Pressing "Unity" leads to different values in Extended Rage mode compared to Normal mode



Extended Ranges

"Extended ranges" are now activated with the controls
Black, **Gamma** and **White**

Black RGB	Range from	-100% to +100%
Black MASTER	Range from	-100% to +100%
Gamma RGB	Range	±60% of Master Range
Gamma MASTER	Range from	0 to 2.5
White RGB	Range from	0% to 200%
White MASTER	Range from	0% to 1000%



Attention!
In "extended range" mode, **unity** results in a different grading comparable to "normal ranges";
White changes to 500% of the standard value
and
Gamma changes from 1 to 1.25.

Changing from "normal range" to "extended range", and in the other way round, requires a re-adjustment of **Black (lift) , Gamma** and **White (gain).**

Details of "Unity" adjustment for extended range, see chapter 4.5.6

4.5.6 Grading Recommendation in "Extended Range" Mode

In order to reduce the reciprocal influence of the controls, it is recommended to start adjustment with **Gamma**, then do **Black** and finally **White**.

Gamma adjustment

With **Master Gamma** (0 - 2.5), the peak level of the "saw_14 test signal" can be changed from 42% up to 100% and down to 7.5%.

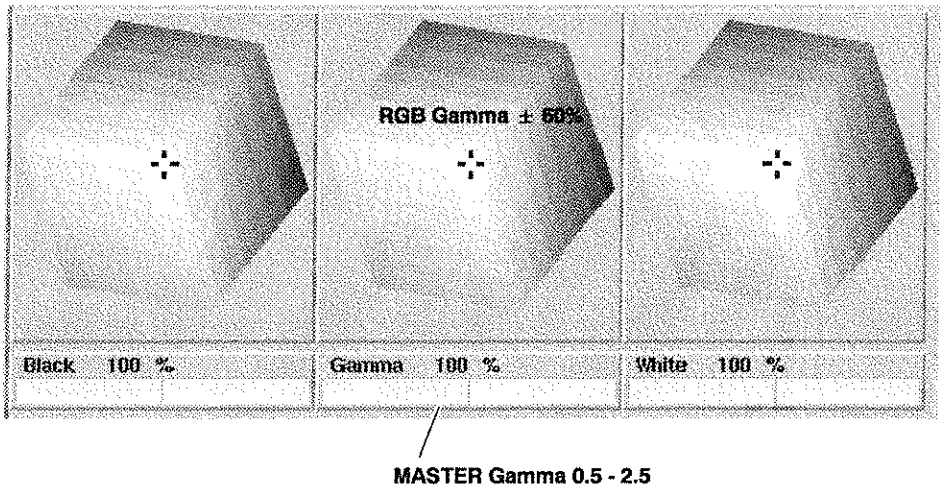


Fig. 415:

In "normal range", **Master gamma** addresses only the grey values of a film scene and changes not the black and white levels.

In "extended range", **Master gamma** also changes black and white.

RGB Gamma changes the **Master Gamma** value between 40% to 160%.

Black adjustment

After gamma adjustment, it is recommended to adjust the black level with the **Black** controls **RGB** and **Master** close to 0%. Note that in extended ranges the **Black** controls also affects the white level.
Both, Black Master and Black RGB can be changed in the range of ± 100%, but the sum is limited to ± 100%.

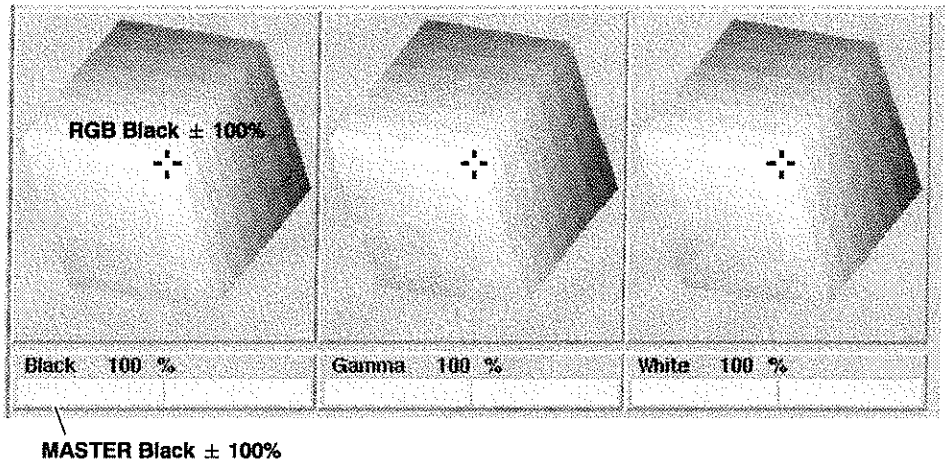


Fig. 416:

White adjustment

Finally adjust the white level of the saw_14 signal with the **White** controls to the desired value.

White RGB range 0% - 200%
White Master range 0% - 1000%

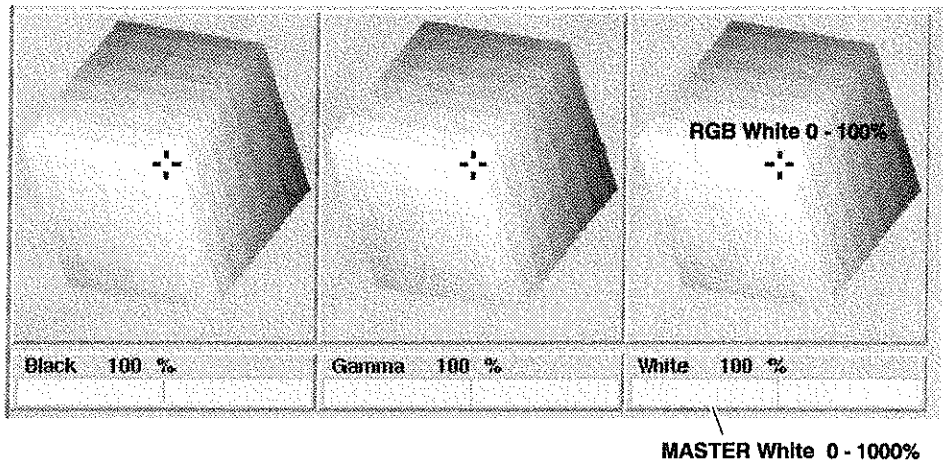


Fig. 417:

4.5.7 Adjustment of the Unity Values in the "Extended Range" Mode

For the "normal mode" and UNITY for all color corrections, you will see a straight sawtooth line on the waveform monitor.

When switching color corrections between "normal" to "extended range" mode the previous settings are not scaled to the other control range and the look of the image changes!

If the neutral position of "extended mode" is not yet stored on your external telecine controller, it can be found by the following procedure:

1. Select the 100% sawtooth test signal
   Menu Color, Col Set - select Pattern - sawtooth 0-100%
2. Press Test button

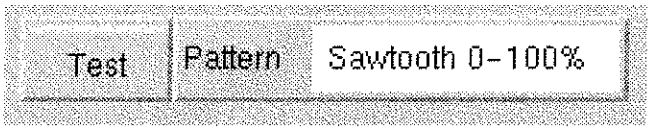


Fig. 418:

3. Select menu Film - press button Film Type and select - Print Positive

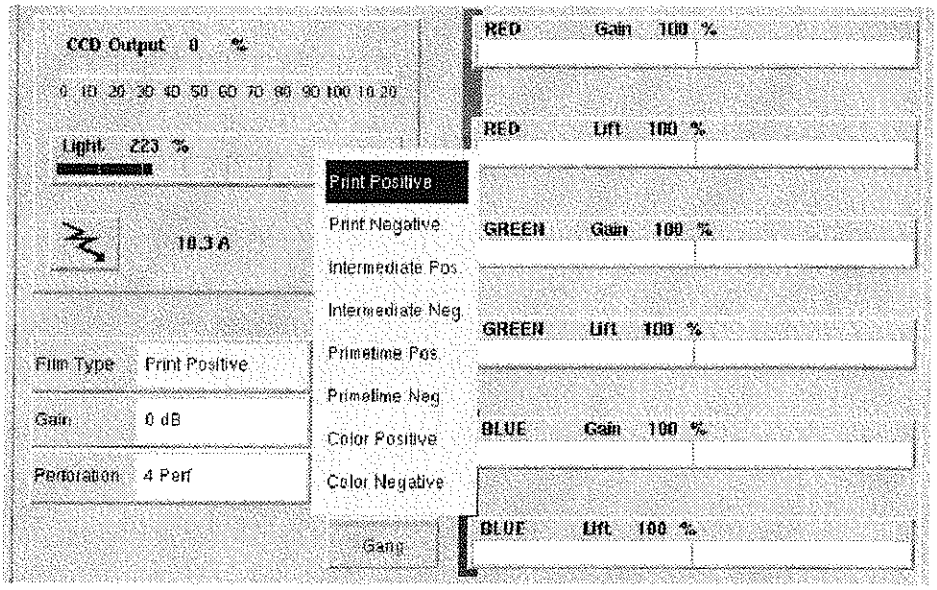


Fig. 419:

4. Set all matching controls to Unity
   Menu Color- submenu Col Set -

Set Unity

5. Set all color parameter to **unity**

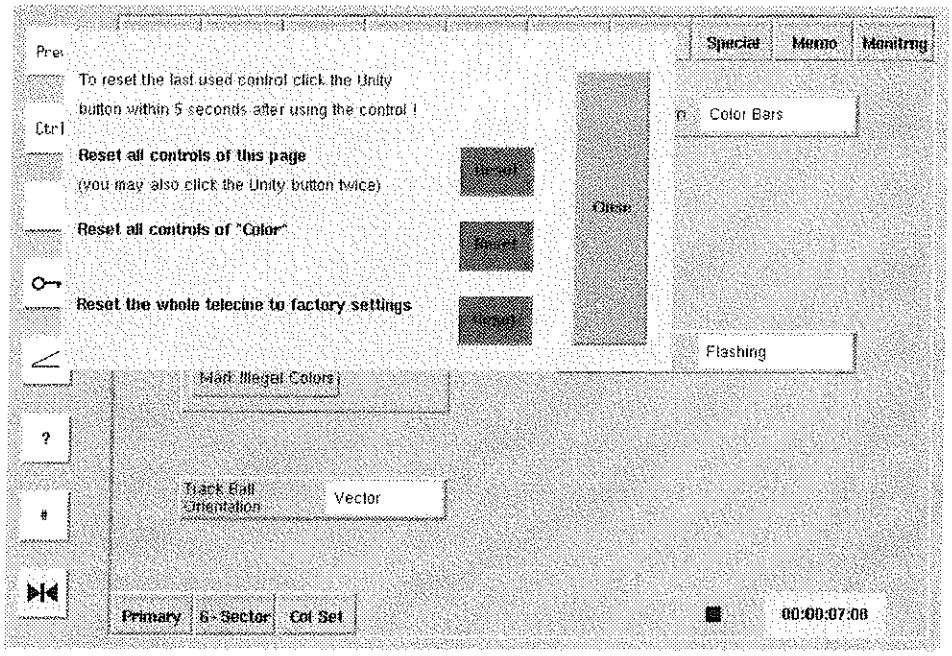


Fig. 420:

6. Switch CRT Gamma OFF

Fig. 421:

7. Select "Control Ranges"

   Set Control Ranges to - Extended (unity normal)

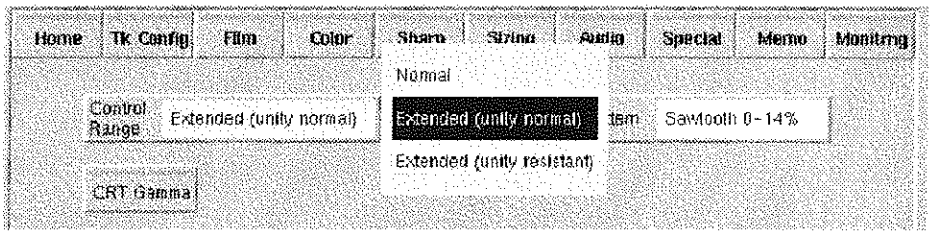


Fig. 422:

Adjustment Unity Values

Pressing unity leads to different values in Extended Range mode compared to NORMAL mode
If you switch to "Extended Range " mode, you will get a curved and clipped sawtooth signal.
By using the SDC 2001 color correction controls of the external telecine controller you can now adjust and straighten the sawtooth line again.

Please store Black, Gamma and White controls as UNITY for the "extended range" mode on the external telecine controller or in the GCP Menu TK Mem.

Unity in Extended Range Mode

The menu color displays the "unity values" in "extended mode" as shown in the next figure.

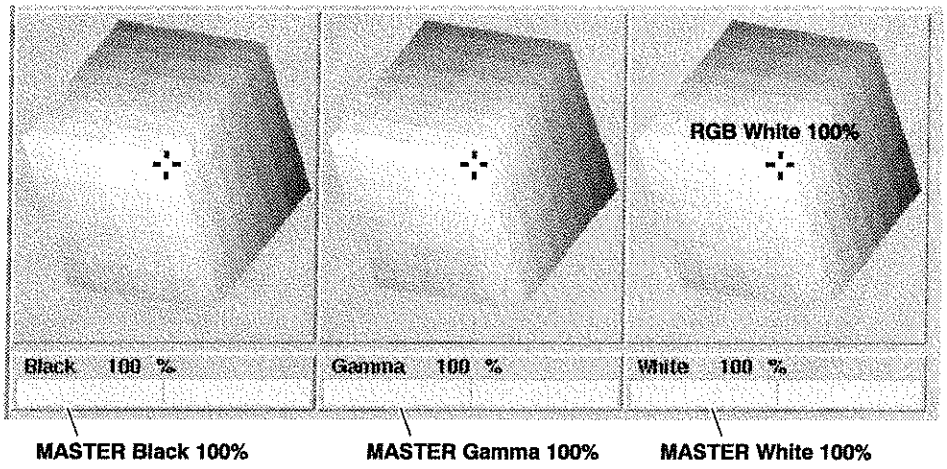


Fig. 423:

The SDC 2001 specifications do not apply to "extended range" mode. Using "extended range" may result in lower signal-to-noise distortion, depending on the adjustments.

4.5.8 High Density Range in Print NEG Mode

In PRINT NEG mode, a higher density range on negative film with no orange mask can be scanned in "extended range" mode.

The density range is extended beyond the standard range (0 - 2) up to 0 - 4.
This feature is activated when "extended range" is selected in the Col Set submenu

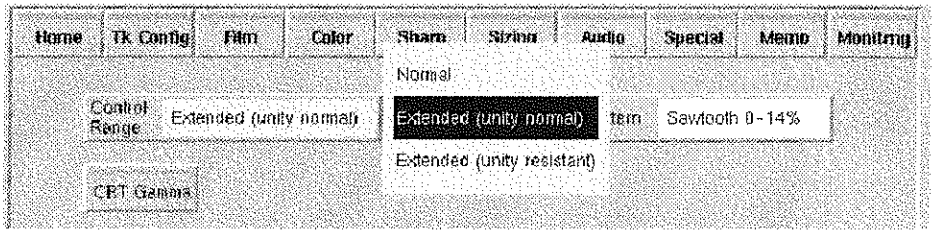


Fig. 448:

and the film type PRINT NEG is chosen in the Film menu - Film type

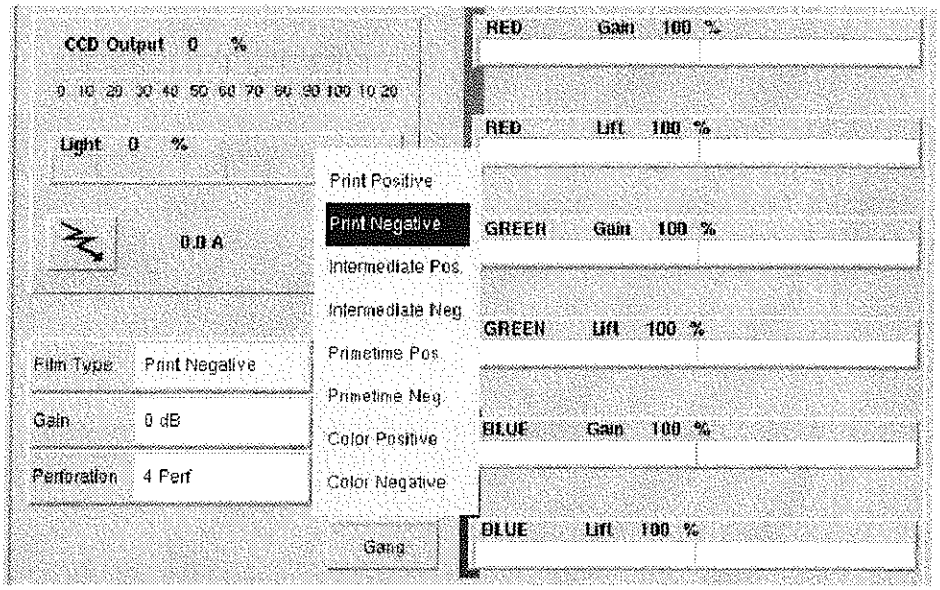


Fig. 424:

4.5.9 Toe - "Black Stretch / Compression"

With Toe "black stretch/compression" the contrast in dark picture areas can be either enlarged or reduced. Four different characteristics according to the diagram in figure 426 are available. Unlike Master gamma, bright picture areas are less affected by this adjustment. The black level is kept constant as well.

1. To use Toe - black stretch/compression -, select menu Color, submenu Primary

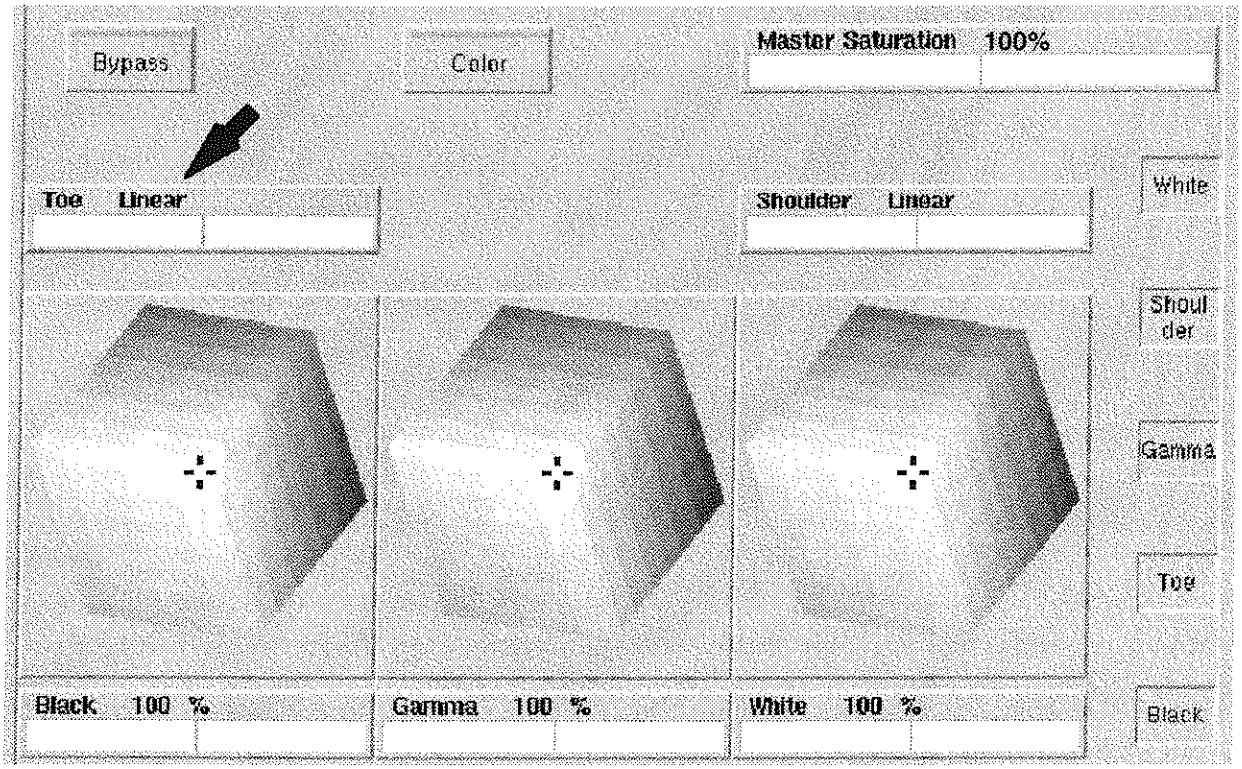


Fig. 425: Main menu **"Color"**

2. To select Toe parameter slide directly on the touchscreen or use the digipot control. The different curves in black are:

   High (big) black **compression**: e.g. 20% level changes to 5%
   Low (small) black **compression**: e.g. 20% level changes to 12%
   linear level, no changes
   Low (small) black **stretch**: e.g. 20% level changes to 28%
   High (big) white **stretch**: e.g. 20% level changes to 35%

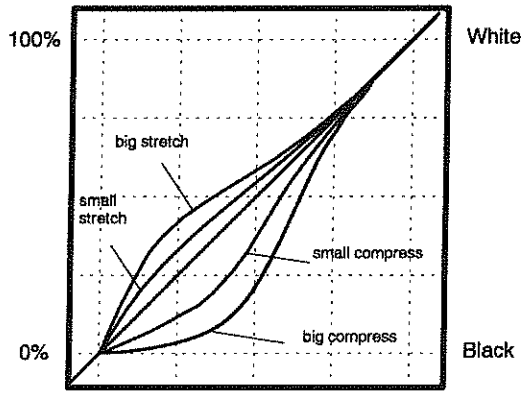


Fig. 426: Black stretch / compression

4.5.10 Shoulder - White Stretch / Compression

With Shoulder - white stretch/compression -, the contrast in bright picture areas can be either enlarged or reduced. Four different characteristics according to the diagram in figure 428 are selectable. Unlike Master Gamma, dark picture areas are less affected by this adjustment. Note that white stretch does not lead to any clipping of highlights (luminance levels above 100%).

1. To use shoulder - white stretch / compression, select menu Color, submenu Primary
2. To select Shoulder parameter slide directly on the touchscreen or use the corresponding digipot

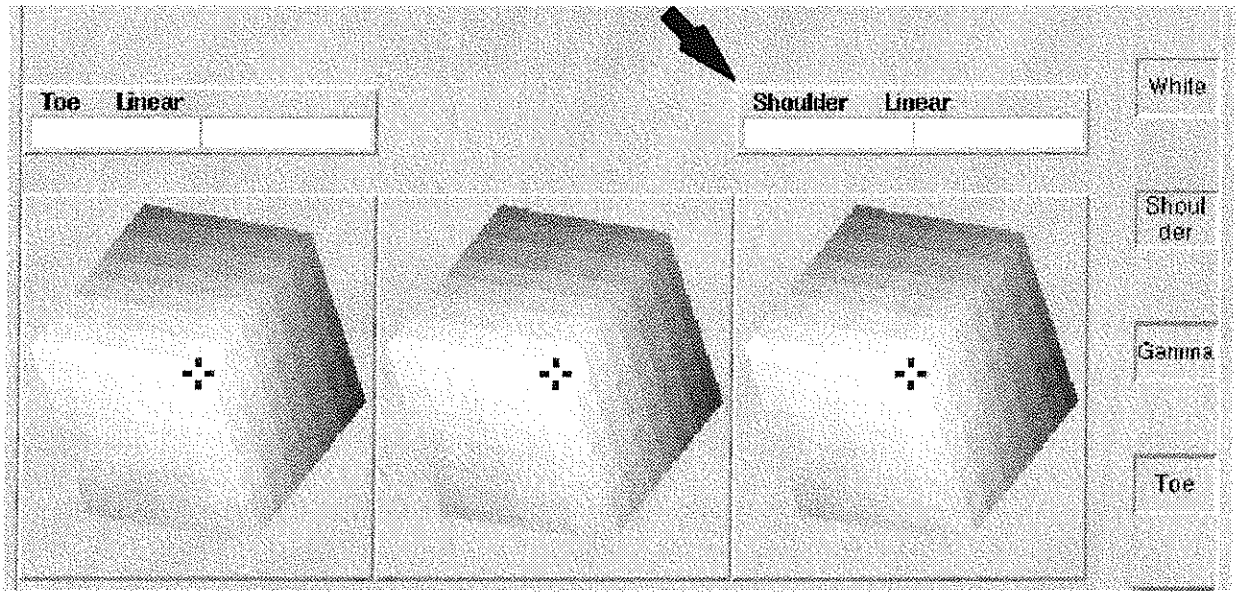


Fig. 427: Main menu **"Color", submenu Primary**

The different curves in white are:

High (big) white **compression**: e.g. 80% level changes to 95%
Low (small) white **compression**: e.g. 80% level changes to 88%
linear level, no changes
Low (small) white **stretch**: e.g. 80% level changes to 70%
High (big) white **stretch**: e.g. 80% level changes to 61%

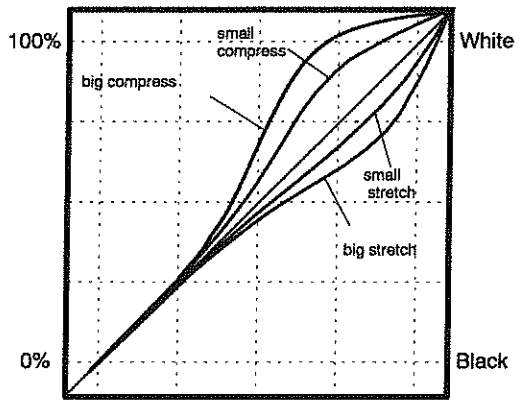


Fig. 428:

4.5.11 Toe & Shoulder (Black and White) combined

By combining Toe & Shoulder (black and white) compression, a print film look can be generated.

1. Select menu Color

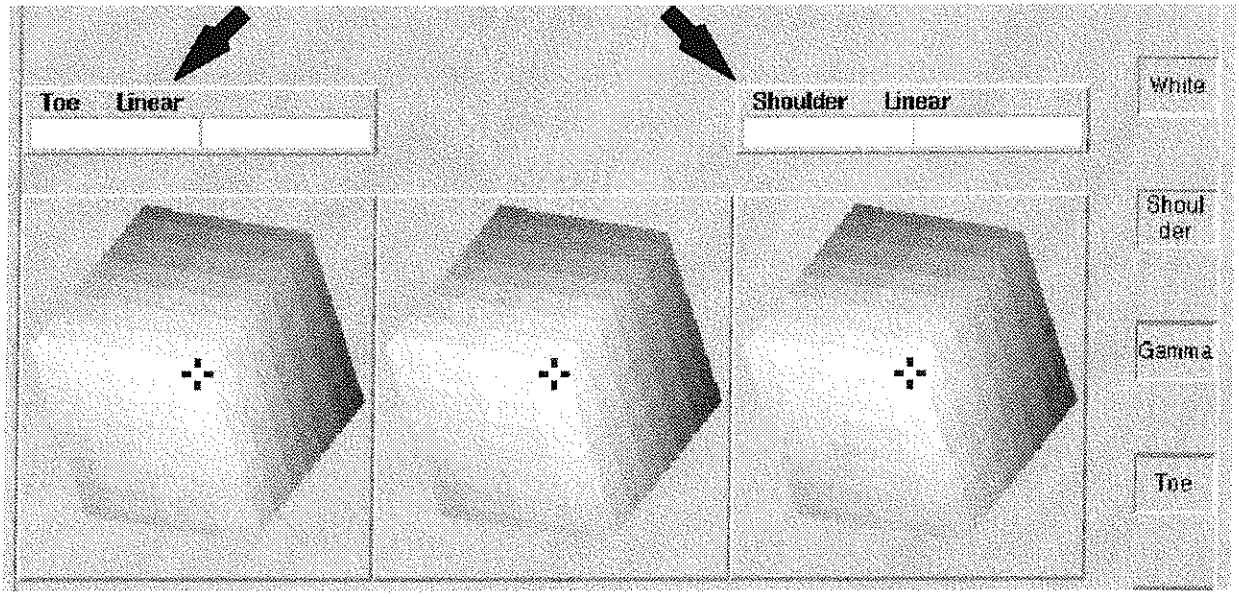


Fig. 429: Main menu **"Color", submenu Primary**

2. Choose Toe (black) parameter by sliding directly the touchscreen

   The different curves for black compression are, see figure 430

   High (big) **black compression**: e.g. 20% level changes to 5%
   Low (small) **black compression**: e.g. 20% level changes to 12%
   linear level, no changes

3. Choose Shoulder (white) parameter by sliding directly on the touchscreen

   The different curves for white compressed are,

   High (big) white **compression**: e.g. 80% level changes to 95%
   Low (small) white **compression**: e.g. 80% level changes to 88%
   linear level, no changes

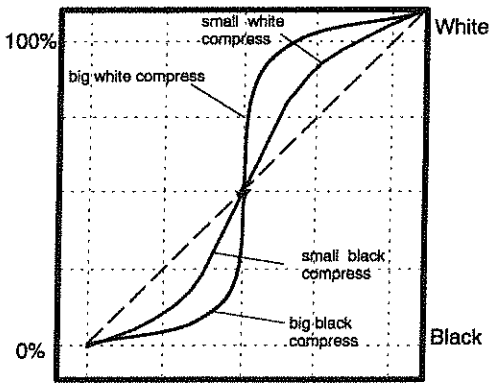
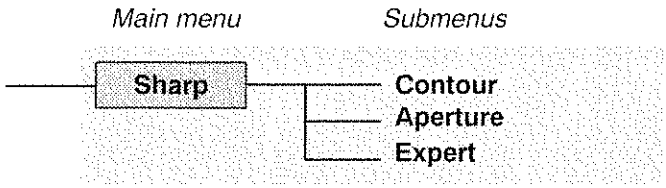


Fig. 430:

4.6 SHARP MENU



4.6.1 SUBMENU "CONTOUR"

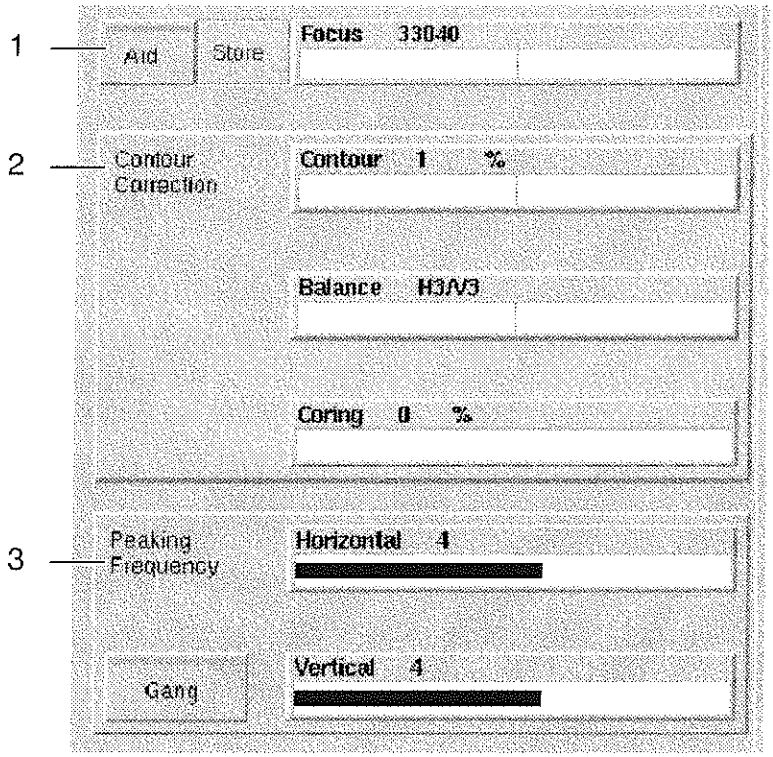


Fig. 431: Main menu "Sharp" / submenu "Contour"

Overview

The main menu **"Sharp"** / submenu **"Contour"** serves to adjust Focus, Contour Correction and Peaking Frequency.

1. Focus, to set the film sharpness
2. Contour Correction, working in H- and V direction

   Balance for balance adjustment between H and V contour correction, fading in 7 steps.
   Coring prevents a sharp figure of noise details in the video signal
3. Peaking Frequency, for adjusting the range of the horizontal or vertical peak frequency, separately or together (to switch with the "Gang" button)

Function Buttons, Controls & Displays

1. Focus

With this bar graph, the film scanner is focused optically to the film material used.
It can be done either with the digipot control or by sliding on the touchscreen.

For optimum focus adjustment it is useful to zoom into image and focus on the grain. For a better detection of the grain, the coring adjustments should be set to 0% and at least the aperture correction should be set to maximum.

Aid
To make focussing easier, hit the **Aid** button.

This macro function sets zoom and contour to maximum and slows down the film speed to 6 frames per second.

Thus, film grain will appear as large and clear as possible which helps to find the optimum focus position.

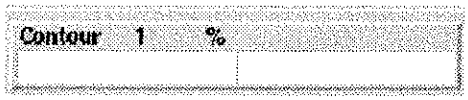
If the chosen value is very different from the unity setting, this should be saved as the new default.

Focus Store

Hitting the **Focus Store** button opens a dialog window. With OK, your new setting will be stored and recalled next time when UNITY is pressed.

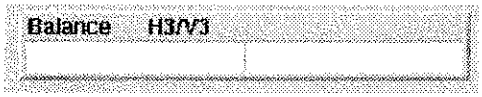
The default focus setting is important as this value is used during FPN and affects the quality of the FPN.

2. Contour



For adjusting the contour correction in the luminance channel with associated +/- display.
The contour correction starts with "0" and increases with "+" values and decreases with "-" values. For optimum adjustment Coring should be set first to 0%.
The contour correction contains following grading setup adjustments:
Contour (Gain) Balance, Peaking Frequency H and Peaking Frequency V.

Balance

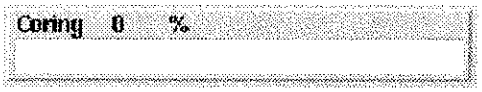


For balance adjustment between H and V contour correction
(fading in 7 steps).

Selection: H only / H3/V1 / H3/V2 / H3/V3 / H2/V3 / H1/V3 / V only

"H only"	only H contour correction adjustable
"H3/V1"	
"H3/V2"	
"H3/V3"	H and V contour correction adjustable
"H2/V3"	
"H1/V3"	
"V only"	only V contour correction adjustable

Coring

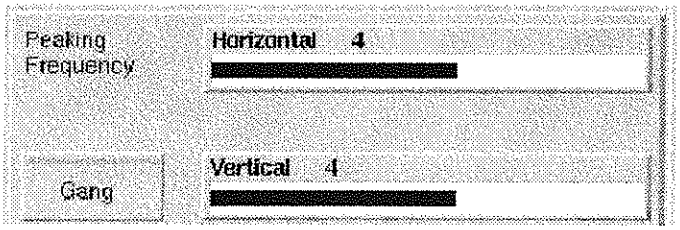


To reduce the contour enhancement for fine low contrast details like grain.

The standard value 0% applies the selected amount of contour correction to all details. For grain reduction an adjustment value around 10% is sufficient.

At 100% coring value, only very high contrast details are enhanced.

3. Peak Frequency



This function offers contour enhancement in dependence on detail size (spatial frequency).

In order to enhance small picture details, select a higher value (high values correspond to high frequencies), to enhance contours of coarse details, select a low value.

Horizontal & Vertical

To change the settings, slide on the touchscreen or use the digipot controls.

The controls for **vertical** and **horizontal** peaking can be handled separately but if there is no need for split settings use the **Gang** function.

Gang

If the button "Gang" is switched on, the horizontal and vertical peak frequency can be adjusted together with either one digipot or slider.
E.g. the vertical peak frequency level is changed and the horizontal level follows in the same way.
The ratio between both levels are maintained in this operation mode.

The ranges of the horizontal or vertical peak frequency are:

Selection: 0 / 1 / 2 / 3 / 4 / 5 / 6 / 7

"0"	range of the horizontal or vertical peak frequency set to 0
"1"	contour correction effects on coarse details
"2"	
"3"	
"4"	contour correction effects on fine details
"5"	
"6"	
"7"	contour correction effects on very fine details

4.6.2 SUBMENU "APERTURE"

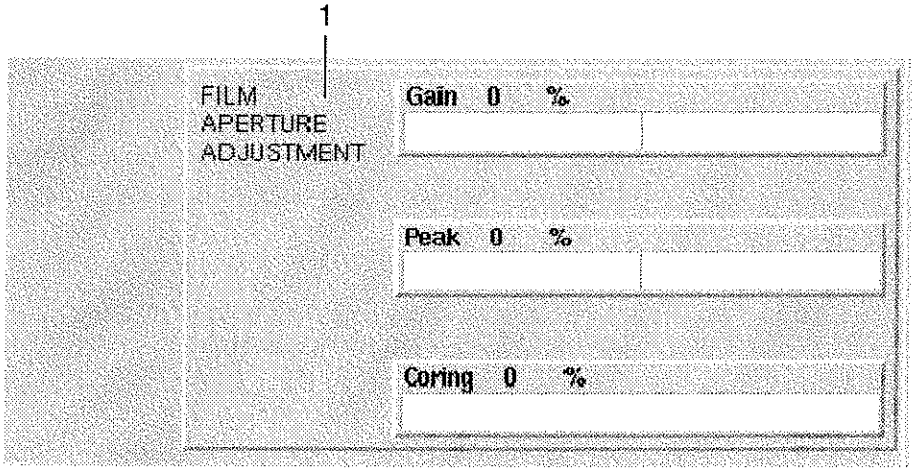


Fig. 432: Main menu **"Sharp"** / submenu **"Aperture"**

Overview

Main menu **"Sharp"** / submenu **"Aperture"**

Aperture adjustment serves to adjust gain, peak and coring of the aperture and compensates system dependent frequency responses of the CCD sensors and the optics.

Function Buttons, Controls & Displays

FILM APERTURE ADJUSTMENT

Gain
Gain adjustment of the aperture correction.

For optimum adjustment, coring should be set first to 0%.

Peak
Adjustment of the peak frequency of the aperture enhancement.
Set Unity for optimum aperture correction!"

In **Unity**, the film related correction of the aperture ($f_{\mathbf{Nyquist}}$ ~39 linepairs/mm for 35mm films) is set to optimum linear scanner response:
>6.6 MHz (outband range) for SDTV
>36 MHz (outband range) for HDTV

Coring
Reduces the aperture enhancement for fine low contrast details like film grain. The standard value 0% applies the selected amount of aperture enhancement to all details.
At 100% only very high contrast details are enhanced.

To change the setting, slide on the touchscreen or use the digipot control.

4.6.3 SUBMENU "EXPERT"

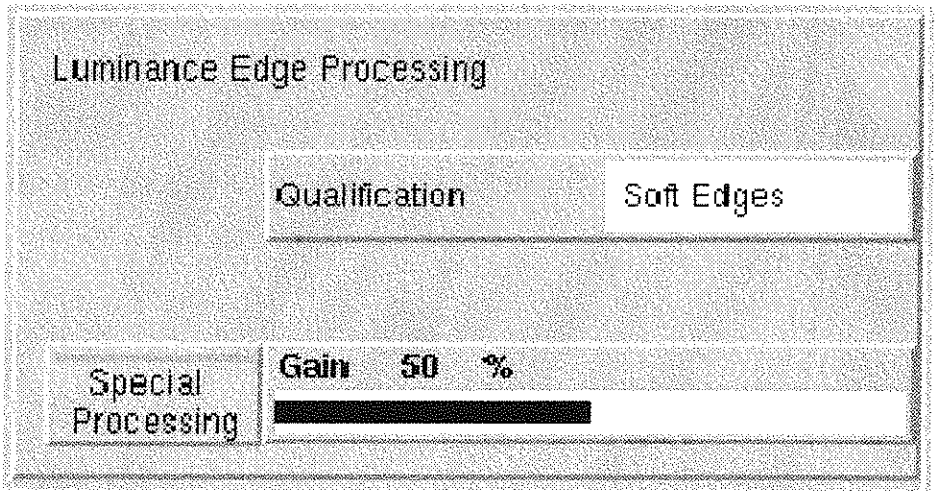


Fig. 433: Main menu **"Sharp"** / submenu **"Expert"**

Overview

Main menu **"Sharp"** / submenu **"Expert"** provides the controls for the Luminance Edge Processing.

This function is designed to reduce ringing effects in the luminance channel.

An adaptive filter is able to reduce the ringing effects at sharp transitions, mostly visible in 4:2:2 outputs.

This function requires the TV Store Boards FY 6311 which are standard in the SDC 2002.

Function Buttons, Controls & Displays

Luminance Edge Processing

Special Processing

Luminance Edge Processing is enabled when the green bar on the button Special Processing is lit.

Qualification

Selection **"Soft Edges"** or **"Hard Edges".** This qualification allows the luminance filter to react on sharp or soft transitions.

Gain

Gain can be adjusted from 0% (no filter influence) up to 100% (full edge influence)

Restrictions

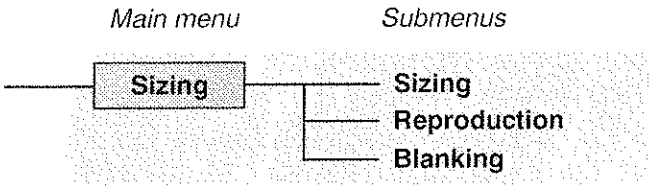
- After Power OFF/ON an activated edge processing is deactivated!
- SDTV:
  Best results of ringing reduction will be achieved with
  maximum aperture correction,
  edge processing gain 20%...25%
  and frequency bandwidth 'high'.

  In case of ZOOM variations it is useful to switch bandwidth from 'HIGH' to 'LOW'.

- HDTV :
  Hard to achieve a better result with collared pictures.

  In case of Black/White material best result was achieved with bandwidth 'HIGH' and Gain 25% ... 50%.

4.7 SIZING MENU



4.7.1 SUBMENU "SIZING"

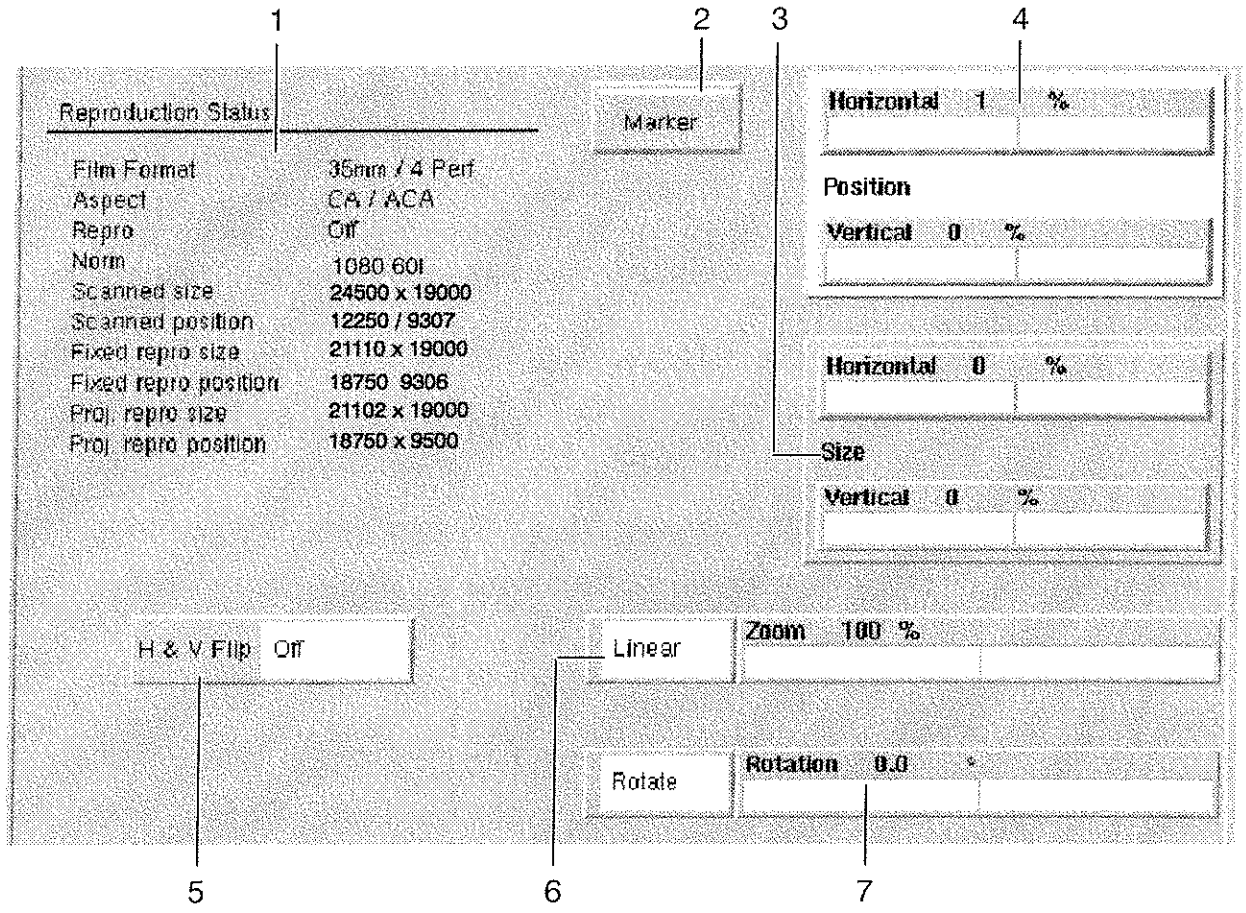


Fig. 434: Main menu **"Sizing"** / submenu **"Sizing"**

Overview

The main menu **"Sizing"** / submenu **"Sizing"** shows the most important film scanning and film reproduction settings for sizing.
The sizing menu shown above, applies to 35mm/4perf films.
For 16mm films and negative films, the display shows 16mm symbols or inverted symbols.

The sizing submenu serves to control the following settings:

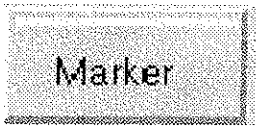
1. Reproduction Status window
2. Marker, insert markers into monitor picture
3. Size controls H & V change the geometry of the output picture
4. Position controls shift the output picture horizontal or vertical
5. H & V Flip flips the picture in both senses
6. Zoom serves to zoom in or out the picture
7. Rotation / Scan Effects turns, skews or tilts the output frame

Details of Function Buttons, Controls & Displays

1. Reproduction Window

This window provides no controls, it only shows the settings of the Repro submenu.

2.



Click on the button to insert the marker into the monitor picture.

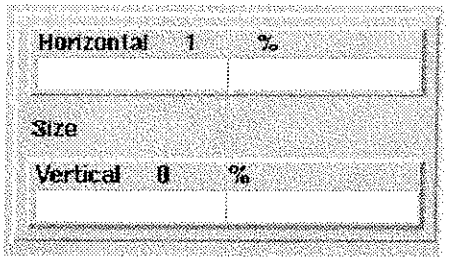
Marker is active when the yellow bar on the button is lit.

You can see the whole scanned film picture and inside the white lines your defined picture area.

To see how it works, use ZOOM for example and watch the marker lines, then switch Marker off again.

Note that Marker is not available with 6 perf (Cinerama) and 8 perf (Vistavision).

3. Reproduction Size



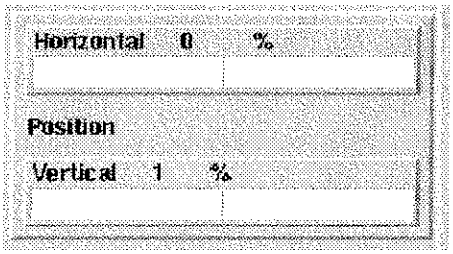
This control changes the geometry of the output picture.

It can be squeezed or stretched by +/- 100% in horizontal and vertical direction.

Click on the area to activate the digipot control. When active, the sliders are highlighted.

To change the setting, slide on the touchscreen or use the corresponding digipot control.

4. Reproduction Position

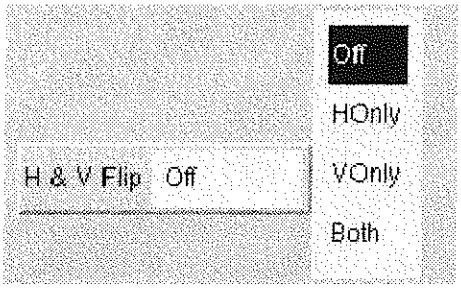


Shifts the output picture horizontally or vertically by +/- 100%.

Click on the area to activate this function. When active, the sliders are highlighted.

To change the setting, slide on the touchscreen or use the corresponding digipot control.

5. H & V Flip



Click on this button and make your choice from the drop-down menu.

Four selections are available:

Off: no effect,

H Only: the picture is flipped horizontally (useful in case the film has been laced up in the wrong sense).

V Only: the picture is flipped upside down. Apart from creative aspects, this function can be used in case the reel has been laced up at the end.

Both flips the picture in both senses: horizontal and vertical. Shifts the output picture horizontally or vertically by +/- 100%.

6. Zoom

Use this slider to zoom in or out of the film frame.

Zooming happens electronically.

When exiting the selection, the last repro adjustment is stored.

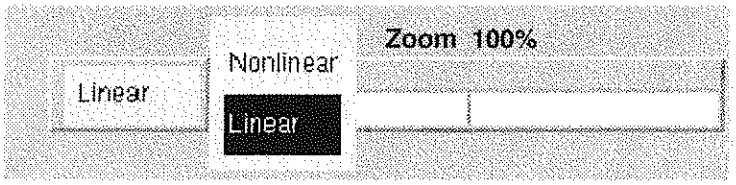
Zoom range: 0.1x to 16x.

To change the settings, slide on the touchscreen or use the digipot control.

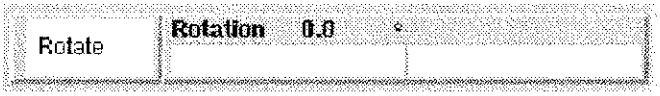
Linear
Nonlinear

You can switch this zoom control from **linear** to **nonlinear**.

Linear: Turning the digipot changes the adjusted values in linear 1:1 mode.
Nonlinear: The adjusted values change the faster the quicker the digipot control is turned.



7. Rotation



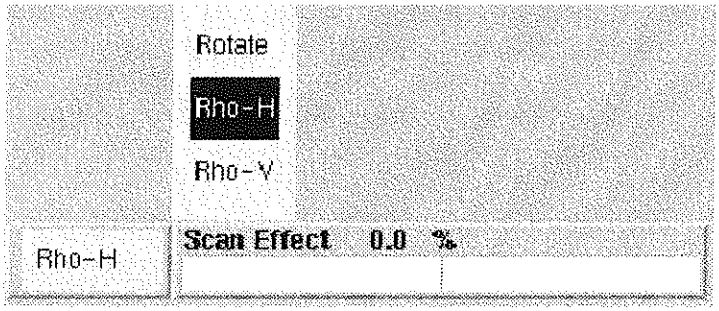
This functions is used for rotating the film frame.

With the adjacent control the picture can be rotated continuously from -180° to +180° in both senses (without resolution reduction!).

The picture can be rotated or skewed / tilted.

Click on the Rotate button and make your choice from the drop-down menu.

Scan effects



Three selections are available:
Rotation, Vertical and Horizontal Rhombic Effect.

The picture can be skewed or tilted in the range of +/-10% which equals 30°.

Note!
If this function is controlled via the POGLE Platinum or TK mems Scan effects, Rhombic H or Rhombic V has to be activated over the whole correction list. Otherwise the effect will not be executed (even if you need this function only in one event of your list).

4.7.2 SUBMENU "REPRODUCTION"

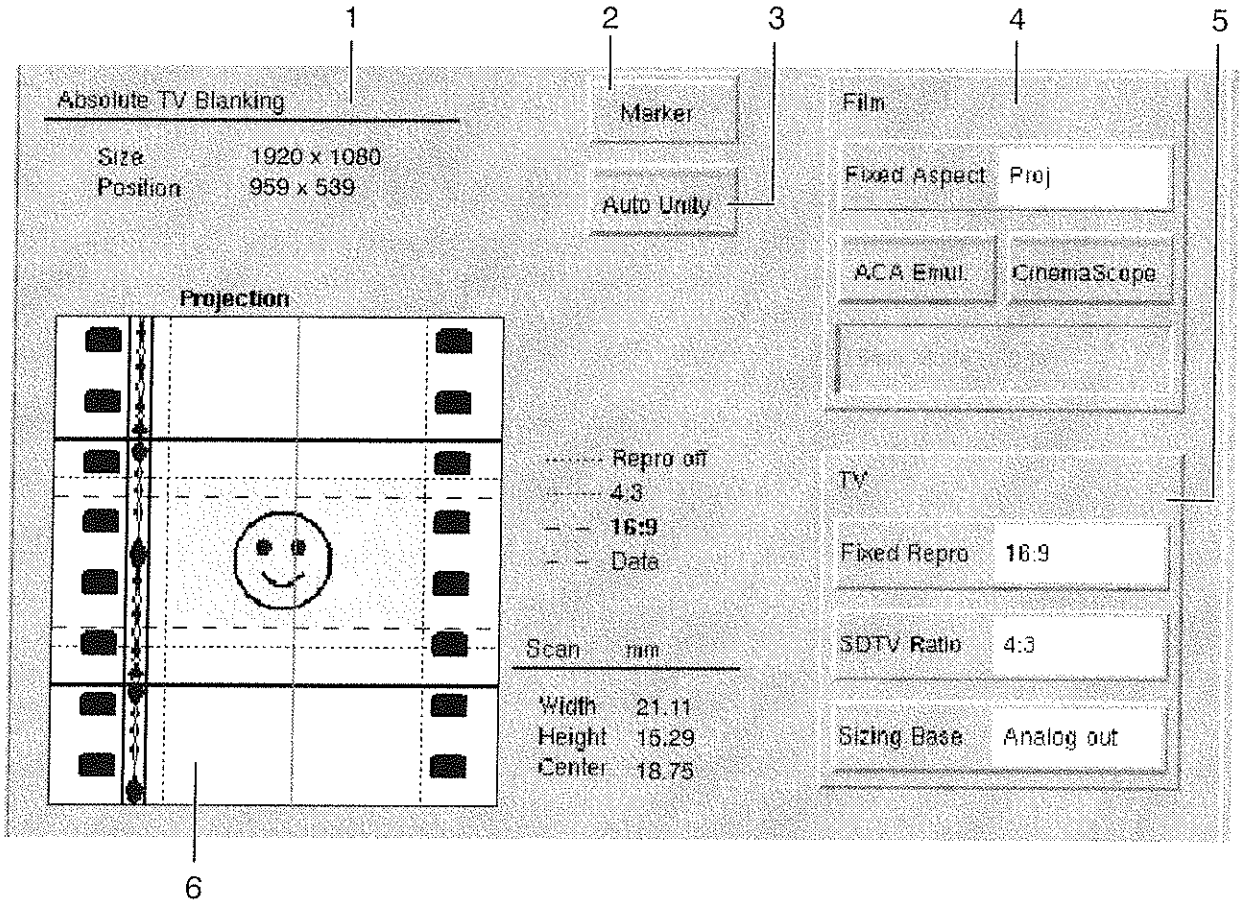


Fig. 435: Submenu **"Sizing"**

Overview

The main menu **"Sizing"** / submenu **"Reproduction"** contains scanning and reproduction settings.

Overview

1. Absolute TV Blanking window shows blanking size and position of the output
2. Marker insert markers into the monitor picture
3. Auto Unity sets sizing parameters to unity after new selection of Aspect & Repro
4. Film Scanning window
5. TV Repro window
6. Display of the scanned area of a film frame.

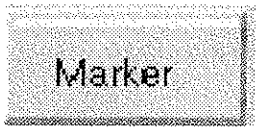
Details of Function Buttons, Controls & Displays

1. Absolute TV Blanking

This window shows in numeric values the section of the output picture which is read out of the frame store in dependence on both settings, Film and TV Blanking.

The upper line shows values for horizontal and vertical size, the lower line for horizontal and vertical position.

2.



Click on the button to insert the marker into the monitor picture.

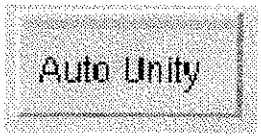
Marker is active when the yellow bar on the button is lit.

You can see the whole scanned film picture and inside the white lines your defined picture area.

To see how it works, use ZOOM for example and watch the marker lines, then switch **Marker** off again.

Note that **Marker** is not available with 6 perf (Cinerama) and 8 perf (Vistavision).

3.

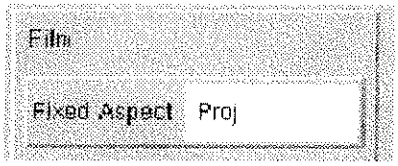


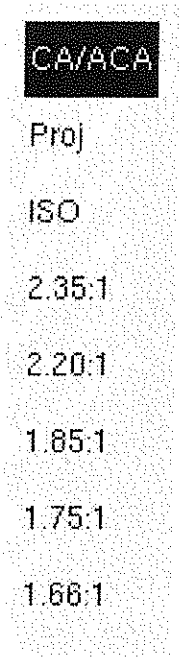
Auto Unity
Selection: On, **Off**

With **Auto Unity** enabled (green bar on the key is lit) you can select a new Fixed Aspect Ratio or Fixed Repro and automatically all variable settings of the Sizing and Blanking menus will be switched to unity.

In order to keep these settings after choosing a new Fixed Aspect Ratio, disable Auto Unity.

4. Film Scanning Window Fixed Aspect



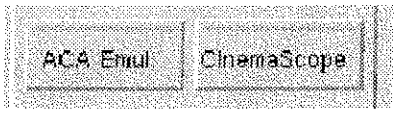


Fixed Aspect
In this window diverse fixed scan settings are selectable. All these settings are strictly film related corresponding to DIN/SMPTE etc. standards.

Selection: FA / PROJ / ISO / 2.35 / 2.20 / 1.85 / 1.75 / **1.66** / EXIT

"CA/AC"	full aperture film scanning
	or "FA" (CA: camera aperture; AC: ACA emulation; FA: full aperture)
"PROJ"	projection window reproduction
"ISO"	reproduction in conformity with ISO 2907
"2.35"	for films with a picture aspect ratio of 1 : 2.35
"2.20"	for films with a picture aspect ratio of 1 : 2.35
"1.85"	for films with a picture aspect ratio of 1 : 1.85
"1.75"	for films with a picture aspect ratio of 1 : 1.75
"**1.66**"	for films with a picture aspect ratio of 1 : 1.66
"EXIT"	closes window, returns the user to the sizing menu

Hint:
Invalid "fixed aspect" formats are displayed on the output monitor as a small horizontal picture window



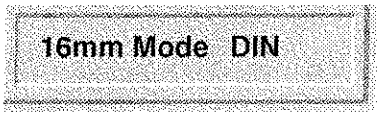
ACA Emul

Enables to operate ACA films with super objectives (by adjusting the blanking). With comopt sound films, we recommend to change the appropriate film gate additionally (option).
The Film gate covers the comopt sound track with an iris frame.

Selection: **OFF** / ON

Cinemascope

Sizing format enables cinemascope (anamorphic) reproduction of the film frame.
Selection: **OFF** / ON
"**OFF**" cinemascope off
"ON" cinemascope on



16mm Mode

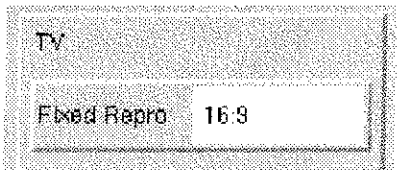
Horizontal center correction for 16mm films.

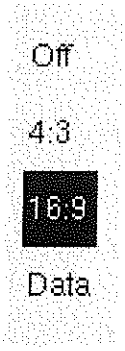
Selection: **DIN** / ISO
"**DIN**" horizontal center correction in conformity with DIN 1602, part 7 and ISO DIS 5768 standard

"**ISO**" horizontal center correction in conformity with ISO 5768 (1981)

5. TV Repro Window

Fixed Repro





Repro makes the picture fit the monitor format (4:3 or 16:9).

This is achieved by zooming in what implies horizontal or vertical losses of picture information.

The following reproduction formats are selectable:

OFF, 4:3, 16:9 and DATA.

Off: The picture is reproduced according to the selected aspect ratio.

4:3: The picture is reproduced in 1.33:1 ratio which means full format on a 4:3 monitor.

16:9: The picture is reproduced in 1.78:1 ratio which means full format on a 16:9 monitor.

Data has two meanings: for video the picture is reproduced in 1.85:1 ratio which is a TV compromise format for Cinemascope (loosing picture information on both sides in exchange for smaller letterbox bars).

Fixed Repro

For Data application: The picture is reproduced into the Output Image Size (e.g. 1920x1440).

Click on the button and make your choice from the drop-down menu.
The current setting is shown on the key display.

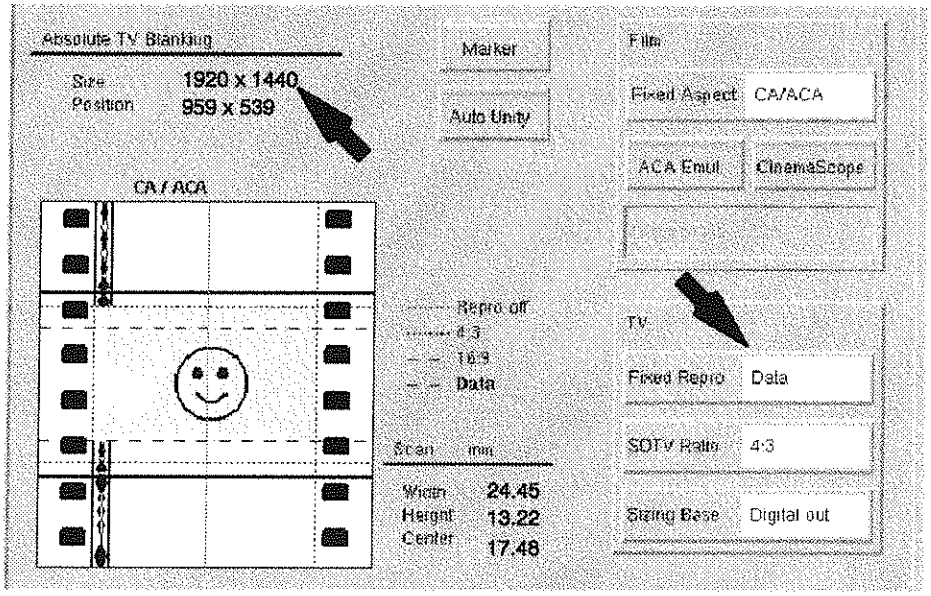


Fig. 449: Menu "Sizing", submenu "Repro", Data Application

Fixed Film Formats

Note!
Tolerances for all fixed film formats, caused by the scanner unit, the testfilm and reading errors may sum up to ±0.2 mm.

Exceptions:
At format values marked with *, the tolerances may sum up to ±0.5 mm, with option "Rotation".
At format values marked with ◆, the tolerances may sum up to ±0.5 mm, without option "Rotation".

35 mm Scanning Formats, 4 Perf, Full Aperture LGA and Gate

sizing setup		scanned area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	24,45	18,80	17,48	FSB FA35 LGA max. scanning area
CA / AC	4:3	24,45	18,34◆	17,48	FSB FA35 LGA max. scanning width => 4:3
CA / AC	1,78	24,45	13,75	17,48	FSB FA 35 LGA max. scanning width => 16:9
CA / AC	Data	24,45	13,22	17,48	FSB FA 35 LGA max. scanning width => 1,85:1
PROJ	off	23,50	17,50	17,48	DIN 15502-6 projection area
PROJ	4:3	23,50	17,63◆	17,48	EBU R86-1997 (DIN 15502-6 width => 4:3)
PROJ	1,78	23,50	13,22	17,48	EBU R86-1997 (DIN 1550-6 width => 16:9)
PROJ	Data	23,50	12,70	17,48	DIN 15502-6 width => 1,85:1
2,35	off	23,50	10,00	17,48	ARRI-1985 projection area 2,35:1
2,35	4:3	13,33	10,00	17,48	2,35:1 => 4:3 PanScan
2,35	1,78	17,78	10,00	17,48	2,35:1 => 16:9 PanScan
2,35	Data	18,50	10,00	17,48	2,35:1 => 1,85:1 PanScan
2,20	off	23,50	10,68	17,48	ARRI-1985 projection area 2,20:1
2,20	4:3	14,24	10,68	17,48	2,20:1 => 4:3 PanScan
2,20	1,78	18,99	10,68	17,48	2,20:1 => 16:9 PanScan
2,20	Data	19,76	10,68	17,48	2,20:1 => 1,85:1 PanScan
1,85	off	23,50	12,70	17,48	ARRI-1985 projection area 1,85:1
1,85	4:3	16,93	12,70	17,48	1,85:1 => 4:3 PanScan
1,85	1,78	22,58	12,70	17,48	1,85:1 => 16:9 PanScan
1,85	Data	23,50	12,70	17,48	ARRI-1985 projection area 1,85:1

Table 436

Workflow for selecting the correct image area in data mode!

Defining of vertical file size

The following workflow for selecting the correct image area is supported by the Spirit DataCine film scanner **(Menu Sizing)**:

a) The desired portion of the image area is selected with the sizing controls (fixed aspect, fixed repro, ACA emulation, cinemascope, zoom H&V, Sizing and Position H&V).

b) At the data output, the file size is selected and the selected image will be squeezed into this size without cropping any image information.

c) If blanking area within these files should be avoided, than the reproduction ratio has to be adjusted to the ratio of the selected image.

d) Helpful for defining the correct file size is the description of the fixed file formats in this chapter.

Here two examples how to calculate file sizes without blanking:

1. Sizing menu selection:
   Fixed Aspect CA/AC
   Fixed Repro OFF
   ACA emul OFF

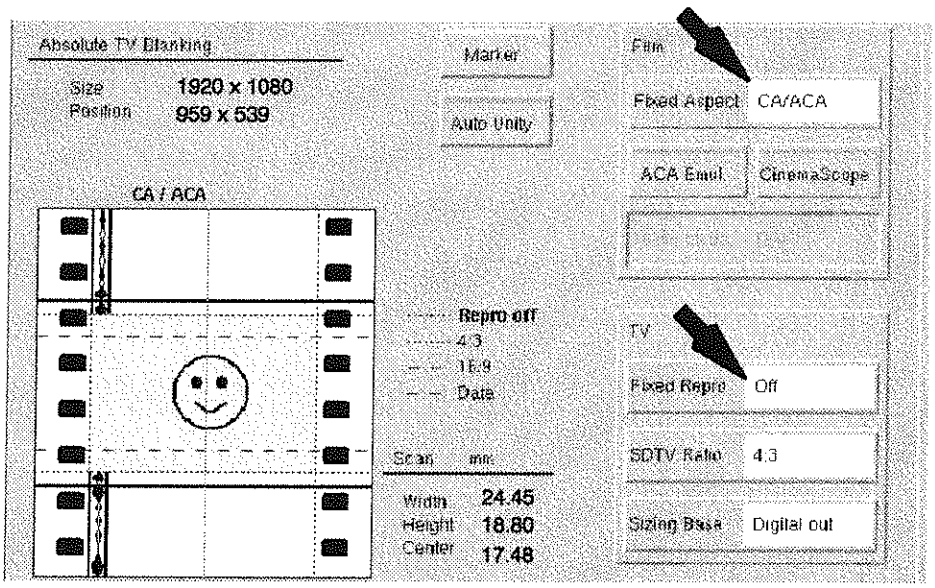


Fig. 450: Menu "Sizing", submenu "Repro"

The table 436 on page 4-149
"35mm scanning formats, 4 perf, Full Aperture LGA and Gate"
lists a size of 24.45mm x 18.80mm => aspect ratio of 1:1.3.

For a desired horizontal file size of 1920 pixels, the vertical file size without blanking is 1920 x 18.80 / 24.45 = 1476 lines.

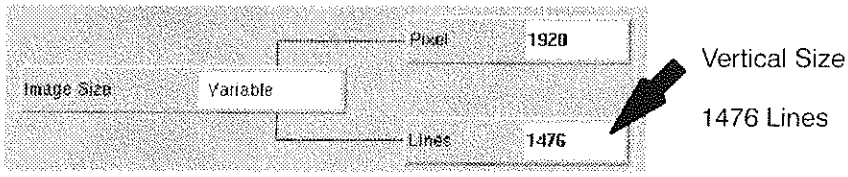


Fig. 451: Submenu "Data"

2. Sizing selection:

   Fixed Aspect CA/AC

   Fixed Repro DATA

   ACA emul OFF

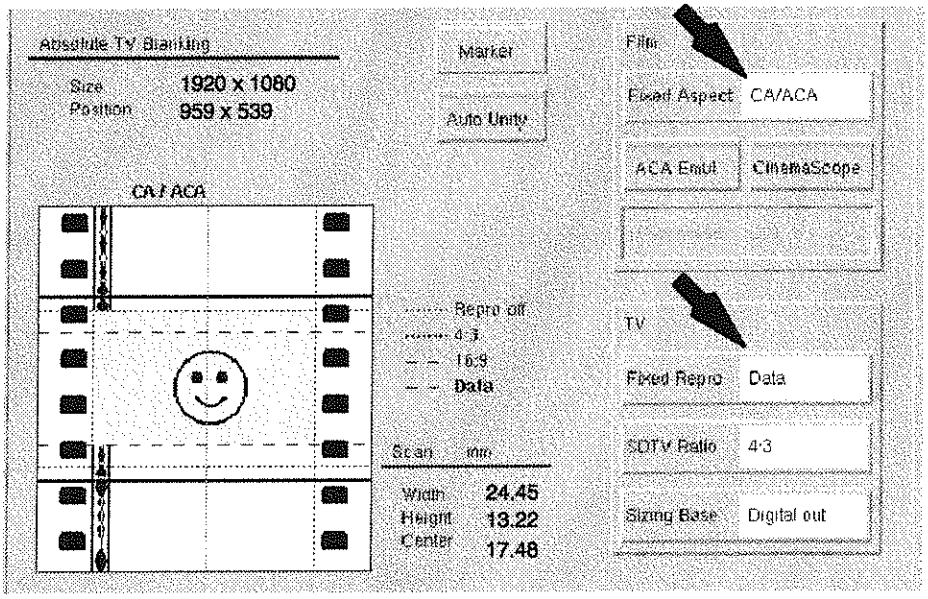


Fig. 452: Menu "Sizing", submenu "Repro"

The table 436 on page 4-149
"35mm scanning formats, 4 perf, Full Aperture LGA and Gate"
lists a size of 24.45mm x 13.22mm => aspect ratio of 1:1.85.

For a desired horizontal file size of 1920 pixels, the vertical file size without blanking is 1920 x 13.22 / 24.45 = 1038 lines.

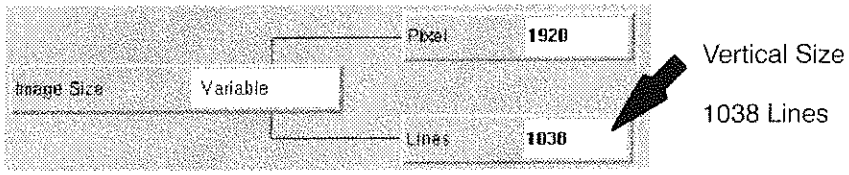


Fig. 453: Submenu "Data"

35mm Scanning Formats, 4 Perf, Full Aperture LGA, ACA Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	21,25	18,80	18,75	FSB 35 LGA = FSB FA35 LGA + FSB 35 GB max. scanning area
CA / AC	4:3	21,25	16,00	18,75	ISO 2906 height => 1.33:1
CA / AC	16:9	21,25	11,95	18,75	FSB 35 LGA max. scanning width => 1.78:1
CA / AC	DATA	21,25	11,49	18,75	FSB 35 LGA max. scanning width => 1,85:1
ISO	off	20,12	15,09	18,75	ISO 1223, DIN 15502-2, EBU R86-1997, SMPTE 96M
ISO	4:3	20,12	15,09	18,75	ISO 1223, DIN 15502-2, EBU R86-1997, SMPTE 96M
ISO	16:9	20,12	11,32	18,75	ISO 1223 width => 16:9
ISO	Data	20,12	10,88	18,75	ISO 1223 width => 1,85:1
1,85	off	21,11	11,33	18,75	ISO 2907 projection area 1,85:1
1,85	4:3	15,11	11,33	18,75	ISO 2907 projection height 1,85:1 => 4:3 PanScan
1,85	16:9	20,14	11,33	18,75	ISO 2907 projection height 1,85:1 => 16:9 Pan-Scan
1,85	Data	20,96	11,33	18,75	ISO 2907 projection height 1,85:1 => 1,85:1 Pan-Scan
1,75	off	21,11	11,96	18,75	ISO 2907 projection area 1,75:1
1,75	4:3	15,95	11,96	18,75	ISO 2907 projection height 1,75:1 => 4:3 PanScan
1,75	16:9	21,11	11,87	18,75	ISO 2907 projection width 1,75:1 => 16:9
1,75	Data	21,11	11,41	18,75	ISO 2907 projection width 1,75:1 => 1,85:1
1,66	off	21,11	12,62	18,75	ISO 2907 projection area 1,66:1
1,66	4:3	16,83	12,62	18,75	ISO 2907 projection height 1,66:1 => 4:3 PanScan
1,66	16:9	21,11	11,87	18,75	ISO 2907 projection width 1,66:1 => 16:9
1,66	Data	21,11	11,41	18,75	ISO 2907 projection width 1,66:1 => 1,85:1

Table 437

35mm Scanning Format, 4 Perf, Full Aperture LGA and Gate, Anamorphic

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	24,45	18,80	* 17,48	FSB FA35 LGA max. scanning area
CA / AC	4:3	12,67	18,80	17,48	FSB FA35 LGA max. scanning height => 4:3 Pan-Scan
CA / AC	16:9	16,89	18,80	17,48	FSB FA35 LGA max. scanning height => 16:9 PanScan
CA / AC	Data	17,57	18,80	17,48	FSB FA35 LGA max. scanning height => 1,85:1 PanScan
PROJ	off	23,80	18,34	17,48	FSB FA35 LGA Cinemascope projection area (Spirit DataCine)
PROJ	4:3	12,23	18,34◆	17,48	FSB FA35 LGA Cinemascope => 4:3 PanScan
PROJ	16:9	16,30	18,34◆	17,48	FSB FA35 LGA Cinemascope => 16:9 PanScan
PROJ	Data	16,96	18,34	17,48	FSB FA35 LGA Cinemascope => 1,85:1 PanScan

Table 438

35mm Scanning Format, 4 Perf, Full Aperture LGA, ACA Gate, Anamorphic

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	21,25	18,80	18,75	FSB 35 LGA = FSB FA35 LGA + FSB 35 GB max. scanning area
CA / AC	4:3	12,55	18,80	18,75	FSB 35 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	16,73	18,80	18,75	FSB 35 LGA max. scanning height => 16:9 Pan-Scan
CA / AC	Data	17,41	18,80	18,75	FSB 35 LGA max. scanning height => 1,85:1 Pan-Scan
2,35	off	21,25	18,21	18,75	derived from ISO 2907 projection area anamorphic
2,35	4:3	12,14	18,21◆	18,75	ISO 2907 projection height anamorphic => 4:3 Pan-Scan
2,35	16:9	16,19	18,21	18,75	ISO 2907 projection height anamorphic => 16:9 PanScan
2,35	Data	16,84	18,21	18,75	ISO 2907 projection height anamorphic => 1,85:1 PanScan
2,20	off	20,03	18,21	18,75	ISO 2907 projection height anamorphic => 2,20:1 PanScan
1,85	off	16,84	18,21	18,75	ISO 2907 projection height anamorphic => 1,85:1 PanScan

Table 439

35mm Scanning Format, 3 Perf, Full Aperture LGA and Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	24,45	14,05	17,48	FSB FA35 LGA max. scanning area
CA / AC	4:3	18,73*◆	14,05	17,48	FSB FA35 LGA max. scanning height => 4:3 Pan-Scan
CA / AC	16:9	24,45	13,78	17,48	FSB FA 35 LGA max. scanning width => 16:9
CA / AC	Data	24,45	13,24	17,48	FSB FA 35 LGA max. scanning width => 1,85:1
PROJ	off	23,50	13,22	17,48	FSB FA35 LGA 3 Perf projection area (Spirit Data-Cine)
PROJ	4:3	17,63	13,22	17,48	FSB FA35 LGA 3 Perf proj.height (Spirit DataCine) => 4:3 PanScan
PROJ	16:9	23,50	13,22	17,48	FSB FA35 LGA 3 Perf projection width (Spirit Data-Cine) => 16:9
PROJ	Data	23,50	12,70	17,48	FSB FA35 LGA 3 Perf projection width (Spirit Data-Cine) => 1,85:1

Table 440

35mm Scanning Format, 3 Perf, Full Aperture LGA, ACA Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	21,25	14,05	18,75	FSB 35 LGA = FSB FA35 LGA + FSB 35 GB max. scanning area
CA / AC	4:3	18,73*◆	14,05	18,75	FSB 35 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	21,25	11,95	18,75	FSB 35 LGA max. scanning width => 16:9
CA / AC	Data	21,25	11,49	18,75	FSB 35 LGA max. scanning width => 1,85:1
PROJ	off	20,96	12,63	18,75	Panavision 1987 projection area 1,66:1
PROJ	4:3	16,84	12,63	18,75	Panavision 1987 projection height 1,66:1 => 4:3 PanScan
PROJ	16:9	20,96	11,79	18,75	Panavision 1987 projection width 1,66:1 => 16:9
PROJ	Data	20,96	11,33	18,75	Panavision 1987 projection width 1,66:1 => 1,85:1
1,85	off	20,96	11,33	18,75	Panavision 1987 projection area 1,85:1
1,85	4:3	15,11	11,33◆	18,75	Panavision 1987 projection width 1,85:1 => 4:3 PanScan
1,85	16:9	20,14	11,33	18,75	Panavision 1987 projection width 1,85:1 => 16:9 PanScan
1,85	Data	20,96	11,33	18,75	Panavision 1987 projection area 1,85:1

Table 441

35mm Scanning Formats, 2 Perf, Full Aperture LGA and Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	24,45◆	9,32	17,48	FSB FA35 LGA max. scanning area
CA / AC	4:3	12,43*◆	9,32	17,48	FSB FA35 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	16,57*◆	9,32	17,48	FSB FA35 LGA max. scanning height => 16:9 PanScan
CA / AC	Data	17,24*◆	9,32	17,48	FSB FA35 LGA max. scanning height => 1,85:1 PanScan

Table 442

35mm Scanning Formats, 2 Perf, Full Aperture LGA, ACA Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	21,25	9,32	18,75	FSB FA35 LGA + FSB 35 GB max. scanning area
CA / AC	4:3	12,43*◆	9,32	18,75	FSB 35 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	16,57*◆	9,32	18,75	FSB 35 LGA max. scanning height => 16:9 Pan-Scan
CA / AC	1,85	17,24*◆	9,32	18,75	FSB 35 LGA max. scanning height => 1,85:1 Pan-Scan
PROJ	off	20,96	8,99	18,75	SMPTE 257 stereoscopic, symmetrical
PROJ	4:3	11,99◆	8,99	18,75	SMPTE 257, symmetrical height => 4:3 PanScan
PROJ	16:9	15,98	8,99	18,75	SMPTE 257, symmetrical height => 16:9 PanScan
PROJ	Data	16,63	8,99	18,75	SMPTE 257, symmetrical height => 1,85:1 Pan-Scan

Table 443

16mm Scanning Formats, Super 16mm LGA and Gate

sizing setup		scanning area				
aspect	repro	scan width	scan height	center line	center line	remark
		[mm]	[mm]	[mm]	[mm]	
				DIN	**ISO**	
CA / AC	off	12,48 **	7,52	9	9,15	FSB S16 LGA max. scanning area
CA / AC	4:3	10,03	7,52	9	9,15	FSB S16 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	12,48	7,02	9	9,15	FSB S16 LGA max. scanning width => 16:9
CA / AC	Data	12,48	6,75	9	9,15	FSB S16 LGA max. scanning width => 1,85:1
PROJ	off	11,64	7,01	9	9,15	ISO 1223 16mm height => 1,66:1 projection area Spirit DataCine
PROJ	4:3	9,35	7,01	9	9,15	1,66:1 => ISO 1223 4:3 PanScan
PROJ	16:9	11,64	6,55	9	9,15	1,66:1 => 16:9
PROJ	Data	11,64	6,29	9	9,15	1,66:1 => 1,85:1
1,85	off	11,64	6,29	9	9,15	1,66:1 projection width Spirit DataCine => 1,85:1
1,85	4:3	8,39	6,29	9	9,15	1,85:1 => 4:3 PanScan
1,85	16:9	11,19	6,29	9	9,15	1,85:1 => 16:9 PanScan
1,85	Data	11,64	6,29	9	9,15	1,66:1 projection width Spirit DataCine => 1,85:1
1,66	off	11,64	7,01	9	9,15	ISO 1223 16mm height => 1,66:1 projection area Spirit DataCine
1,66	4:3	9,35	7,01	9	9,15	1,66:1 => ISO 1223 4:3 PanScan
1,66	16:9	11,64	6,55	9	9,15	1,66:1 => 16:9
1,66	Data	11,64	6,29	9	9,15	1,66:1 => 1,85:1

Table 444

** = Scan width will be reduced if center position "16mm mode = **ISO**" (menu Sizing - F12) is selected.

16mm Scanning Formats, Super 16mm LGA, 16mm Gate

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	9,75	7,52	7,98	FSB S16 LGA + FSB 16 GB max. scanning area
CA / AC	4:3	9,75	7,31	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 4:3
CA / AC	16:9	9,75	5,48	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 16:9
CA / AC	1,85	9,75	5,27	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 1,85:1
PROJ	off	9,65	7,26	7,98	EBU R86-1997 (ISO 359-1977, ANSI/SMPTE 233-1987 proj.area)
PROJ	4:3	9,65	7,24	7,98	EBU R86-1997 (ISO 359-1977 width => 4:3)
PROJ	16:9	9,65	5,43	7,98	ISO 359-1977 width => 16:9
PROJ	Data	9,65	5,22	7,98	ISO 359-1977 width => 1,85:1
ISO	off	9,35	7,01	7,98	ISO 1223, DIN 15502-2, EBU R86-1997, SMPTE 96M
ISO	4:3	9,35	7,01	7,98	ISO 1223, DIN 15502-2, EBU R86-1997, SMPTE 96M
ISO	16:9	9,35	5,26	7,98	ISO 1223 scanning width => 16:9
ISO	Data	9,35	5,05	7,98	ISO 1223 scanning width => 1,85:1
1,85	off	9,65	5,22	7,98	ISO 359-1977, ANSI/SMPTE 233-1987 projection width => 1,85:1
1,85	4:3	6,96	5,22	7,98	1,85:1 => 4:3 PanScan
1,85	16:9	*9,27*	5,22	7,98	1,85:1 => 16:9 PanScan
1,85	Data	9,65	5,22	7,98	1,85:1
1,75	off	9,65	5,51	7,98	ISO 359-1977, ANSI/SMPTE 233-1987 projection width => 1,75:1
1,75	4:3	7,35	5,51	7,98	1,75:1 => 4:3 PanScan
1,75	16:9	9,65	5,43	7,98	1,75:1 => 16:9
1,75	Data	9,65	5,22	7,98	1,75:1 => 1,85:1
1,66	off	9,65	5,81	7,98	ISO 359-1977, ANSI/SMPTE 233-1987 projection width => 1,66:1
1,66	4:3	7,75	5,81	7,98	1,66:1 => 4:3 PanScan
1,66	16:9	9,65	5,43	7,98	1,66:1 => 16:9
1,66	Data	9,65	5,22	7,98	1,66:1 => 1,85:1

Table 445

16mm Scanning Formats, Super LGA and Gate, Anamorphic

sizing setup		scanning area				
aspect	repro	scan width	scan height	center line	center line	remark
		[mm]	[mm]	[mm]	[mm]	
				DIN	**ISO**	
CA / AC	off	12,48 **	7,52	9	9,15	FSB S16 LGA max. scanning area
CA / AC	4:3	5,01	7,52	9	9,15	FSB S16 LGA max. scanning height => 4:3 PanScan
CA / AC	16:9	6,68	7,52	9	9,15	FSB S16 LGA max. scanning height => 16:9 PanScan
CA / AC	Data	6,95	7,52	9	9,15	FSB S16 LGA max. scanning height => 1,85:1 PanScan

Table 446

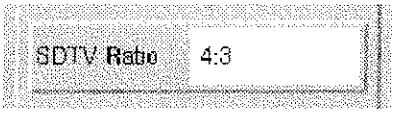
** = Scan width will be reduced if center position "16mm mode = **ISO**" (menu Sizing - F12) is selected.

16mm Scanning Formats, Super 16mm LGA, 16mm Gate, Anamorphic

sizing setup		scanning area			
aspect	repro	scan width	scan height	center line	remark
		[mm]	[mm]	[mm]	
CA / AC	off	9,75	7,52	7,98	FSB S16 LGA + FSB 16 GB max. scanning area
CA / AC	4:3	5,01	7,52	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 4:3
CA / AC	1,78	6,68	7,52	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 16:9
CA / AC	Data	6,95	7,52	7,98	FSB S16 LGA + FSB 16 GB max. scanning width => 1,85:1
2,35 CA	off	8,82	7,47	7,98	SMPTE 65-1991: 2,35:1 ACA 35mm => 16mm cont.dupli. NEG area
2,35 CA	4:3	4,98	7,47	7,98	2,35:1 CA scanning height => 4:3 PanScan
2,35 CA	16:9	6,64	7,47	7,98	2,35:1 CA scanning height => 16:9 PanScan
2,35 CA	Data	6,91	7,47	7,98	2,35:1 CA scanning height => 1,85:1 PanScan
2,35	off	8,59	7,31	7,98	Spirit DataCine projection area 2,35:1
2,35	4:3	4,88	7,31	7,98	2,35:1 => 4:3 PanScan
2,35	16:9	6,50	7,31	7,98	2,35:1 => 16:9 PanScan
2,35	Data	6,77	7,31	7,98	2,35:1 => 1,85:1 PanScan

Table 447

TV Repro Window

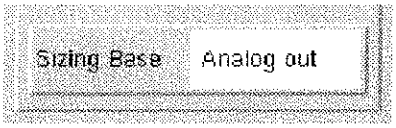


SDTV Ratio

Selection: **4:3** / **16:9**

Picture aspect ratio for the SDTV output can be switched from 4:3 to 16:9.Click on the button and make your decision from the drop-down menu.
The current setting is shown on the key display.

TV Repro Window



Sizing Base

Selection: **Analog Out** / Digital Out

Sizing Base affects the pixel geometry.

This function tries to cover the gap between analog and digital standards.

The analog standard defines: active video line is approx. 52µs.

The digital standard CCIR 601defines 720 pixels per line with a clock rate of 74ns per pixel (13,5 MHz pixel clock).

As a result the active video line is 53,28µs.

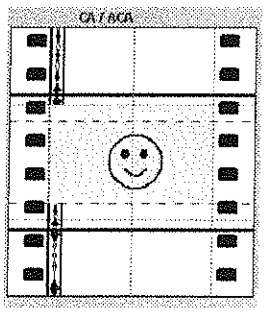
Now in order not to extend the active video line of 52µs

(corresponding to the analog standard), the pixels are squeezed horizontally.

This is what happens when Sizing BAse is switched to analog, it looks like a change in horizontal size (x-Zoom).

The standard setting is digital.

6. Display of the scanned area of a film frame



This depends on the following settings:

Fixed Aspect, ACA Emulation, Cinemascope, Fixed Repro, Film Perforation, and Film Format (35, 16 or 8 mm).

The scanning range is displayed by an orange rectangle.

The chosen Aspect setting is displayed above the film picture.

All possible Repro settings are marked as dotted line.

The actual Repro setting is displayed in bold letters.

The smiley in the center of picture indicates whether the picture is projected uncompressed, compressed (Cinemascope) or rotated (8 perf films).

4.7.3 SUBMENU "BLANKING"

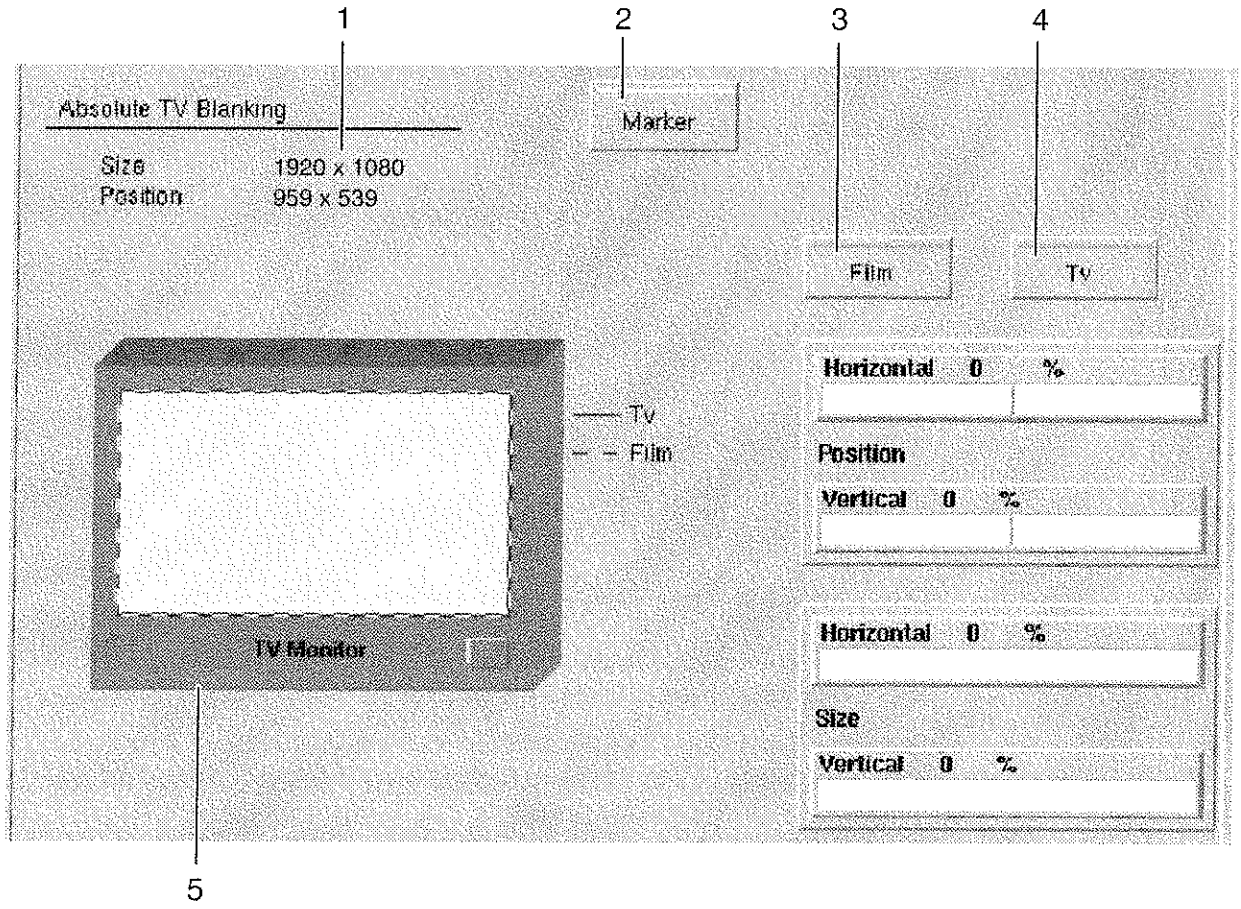


Fig. 448: Main menu **"Sizing"** / submenu **"Blanking"**

Overview

The main menu **"Sizing"** / submenu **"Blanking"** contains Film and TV controls. The user adjusts in this submenu the film and TV blanking or resets the blanking to standard values.

1. Absolute TV Blanking of size and position
2. Marker insert markers into monitor picture
3. Film blanking controls determine the frame which is written into the film store
4. TV blanking controls determine the frame which is read out of the film store
5. TV Monitor symbol serves to display the actual blanking in the active film frame

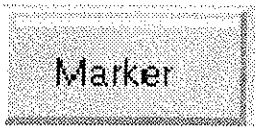
Details of Function Buttons, Controls & Displays

1. Absolute TV Blanking Window

It shows in numeric values the section of the output picture which is read out of the frame store in dependence on both settings, Film and TV Blanking.

The upper line shows values for horizontal and vertical size, the lower line for horizontal and vertical position.

2.



Click on the button to insert the marker into the monitor picture.

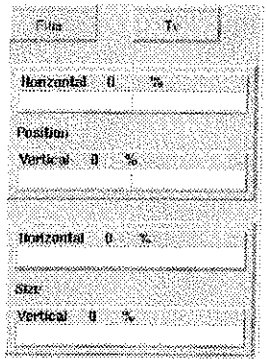
Marker is active when the yellow bar on the button is lit.

You can see the whole scanned film picture and inside the white lines your defined picture area.

To see how it works, use ZOOM for example and watch the marker lines, then switch **Marker** off again.

Note that **Marker** is not available with 6 perf (Cinerama) and 8 perf (Vistavision).

3. Film Blanking Window



Click on the "Film" button to delegate the digipots to Film Blanking adjustments.

The Film Blanking adjustments (Size and Position) determine the section of the picture which is written into the frame store.

Film Blanking becomes part of the picture (with black content). E.g. when you zoom or rotate the picture also the blanking will be zoomed or rotated.

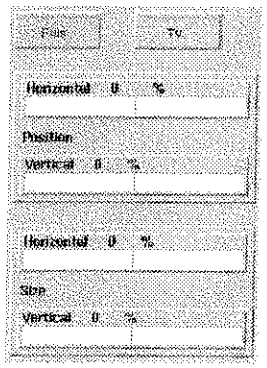
All controls range from -100 to +100%.

To change settings, slide on the touchscreen or use the corresponding digipot control.

The actual Film Blanking adjustments are displayed on the "TV Monitor" symbol.

The reproduced (resulting) picture is the orange marked area (the overlapping section of the Film and the TV rectangle).

4. TV Blanking Window



Click on the "TV" button to delegate the digipots to TV Blanking adjustments.

The TV Blanking adjustments (SIZE and POSITION) determine the section of the picture which is read out of the frame store.

TV Blanking is not part of the picture, it behaves like an external Blanking rendered by a production switcher.

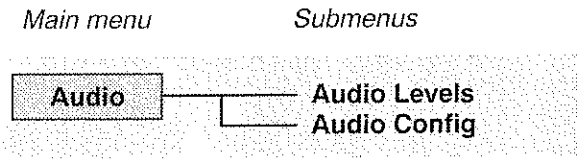
E.g. you can zoom or rotate your picture and the TV blanking will not be affected by it.

All controls range from -100 to +100%. To change settings, slide on the touchscreen or use the corresponding digipot control.

The actual TV Blanking adjustments are displayed on the "TV Monitor" symbol.

The reproduced (resulting) picture is the orange marked area (the overlapping section of the Film and the TV rectangle).

4.8 AUDIO MENU



4.8.1 SUBMENU AUDIO LEVELS

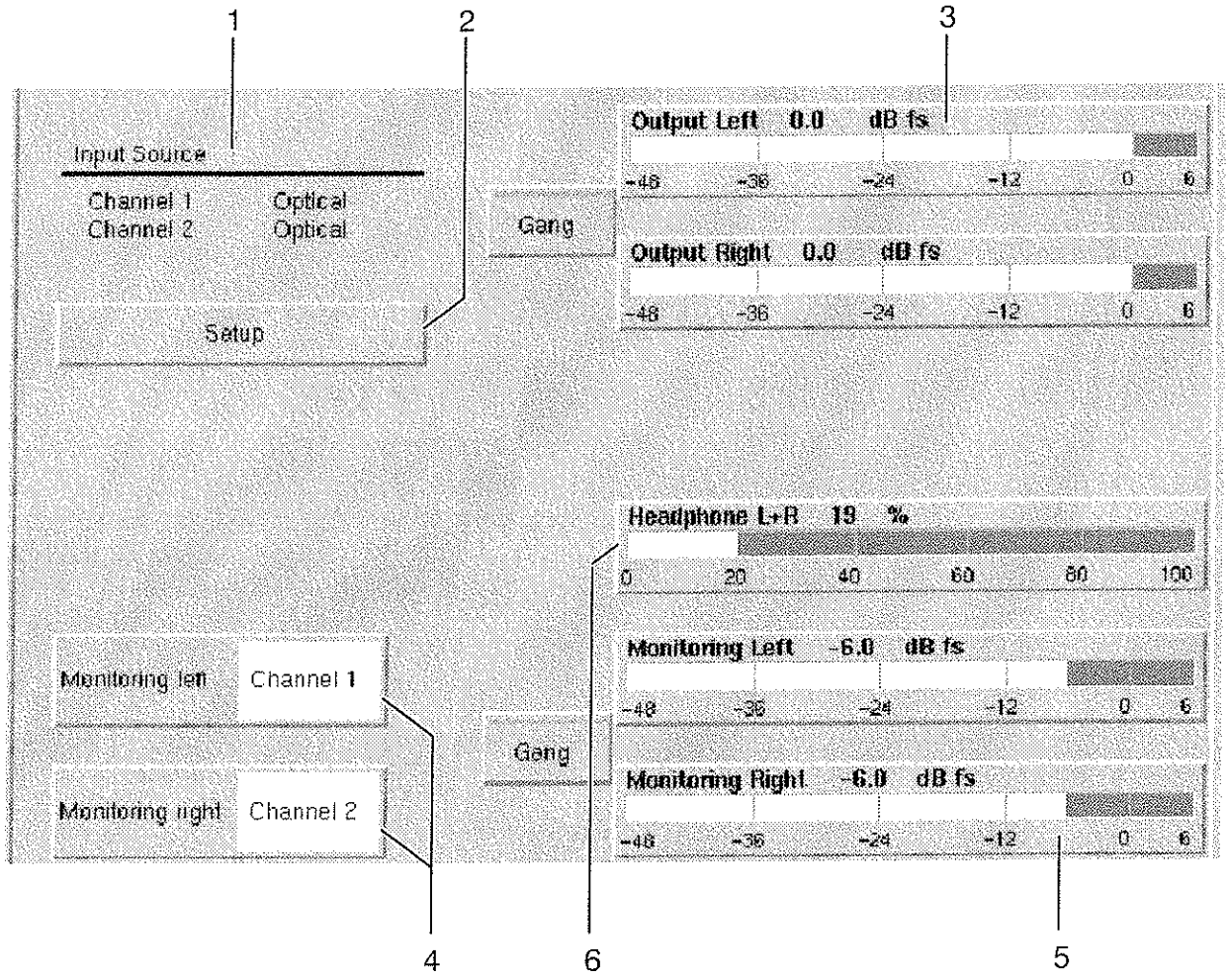


Fig. 449: Submenu Audio Levels

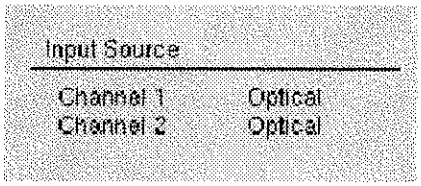
Overview

Submenu Audio Levels covers all sorts of Audio reproduction levels.

1. Input source window
2. Setup Selection
3. Audio Output Level Controls left & right
4. Monitor Selection left & right
5. Monitoring Attenuator left & right
6. Headphone Attenuator

Details of Function Buttons, Controls & Displays

1. Input Source

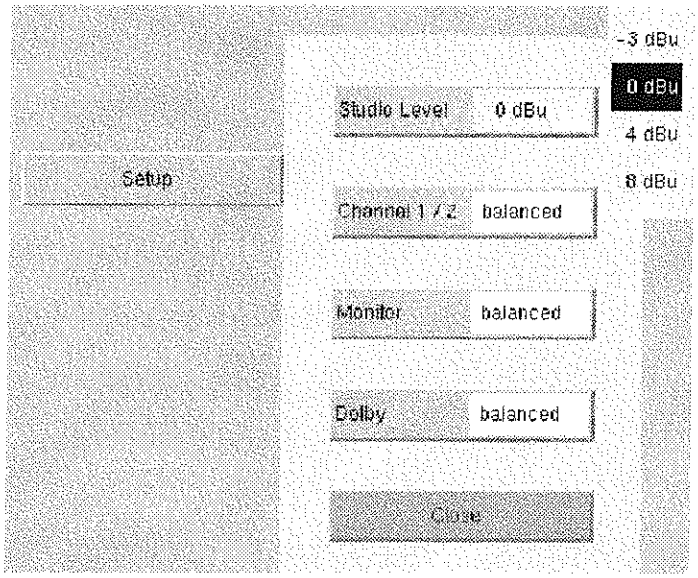


The signal sources for the two audio channels shown on this display are selected in main menu "Audio Config."

Display channel 1
with following signal sources: **magnetical, optical, ext 1, test, off**

Display channel 2
with following signal sources: **optical, ext 1, test, off**

2. Setup



Setup Studio Level

The studio level shows the output level in dBu which corresponds to a level of 0 VU in the film scanner.
It is possible to select studio levels of **-3 dBu, 0 dBu, 4 dBu** and **8 dBu**.

Click on the Studio Level button and make your choice from the drop-down menu

Setup Channel 1 / 2

Balanced and unbalanced

With the studio levels of 4 dBu and 8 dBu, the Audio output final stage is switched to floating mode if the load is unbalanced.
With this, the output level is reduced by 6 dB.

At -3 dBu and 0 dBu, the output is always floating.

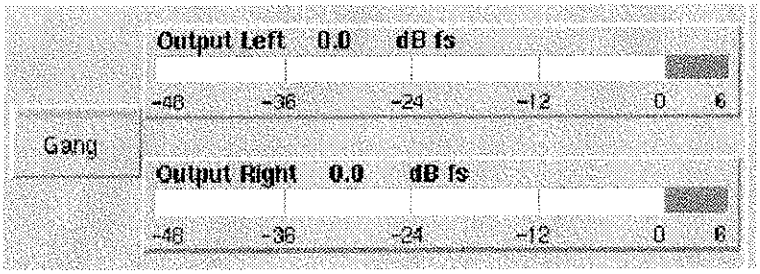
Setup Monitor

This function key has the same function as setup Channel 1/2, but applies to the monitor outputs.

Setup Dolby

This function key has the same function as Setup Channel 1/2, but applies to the monitor outputs.

3. Audio Output Level Controls

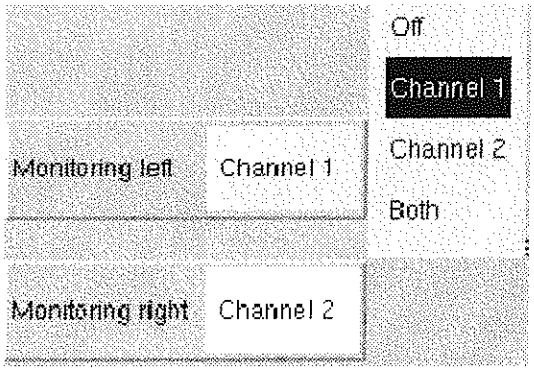


These keys control the Audio Output Level for the left and right channel.
To modify, slide on the touchscreen or use the digipot control.

Audio range is from **-48 dB fs** to **+6 dB fs** (fs = full scale).

A level meter shows the current level and a peak value of your current program sound.

4. Monitoring Selection



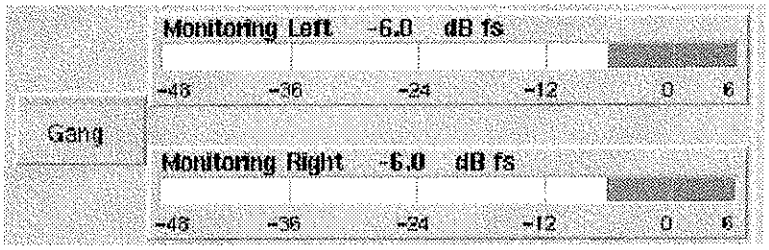
For Monitoring left and Monitoring right, four selections are possible:

Off, Channel 1, Channel 2, Both.

The display refers to the two monitor output sockets MONITOR OUT L & R .

Click on the button and make your choice from the drop-down menu.

5. Monitoring Attenuator



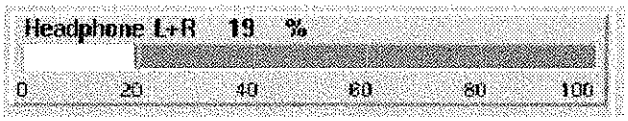
These keys control the Monitor output level for the left and right channels.

To modify, slide on the touchscreen or use the digipot control.
To adjust left right together switch the Gang button.
The range is from **-48dB** to **+6dB**.

The current settings are shown on the key displays.

Note that **AUDIO is an option** on your DataCine!

6. Headphone Attenuator



This key controls the headphone output level.

To modify, slide on the touchscreen or use the digipot control.

The range is from **0 to 100%**.

The current setting is shown on the key display.

4.8.2 SUBMENU "AUDIO CONFIG"

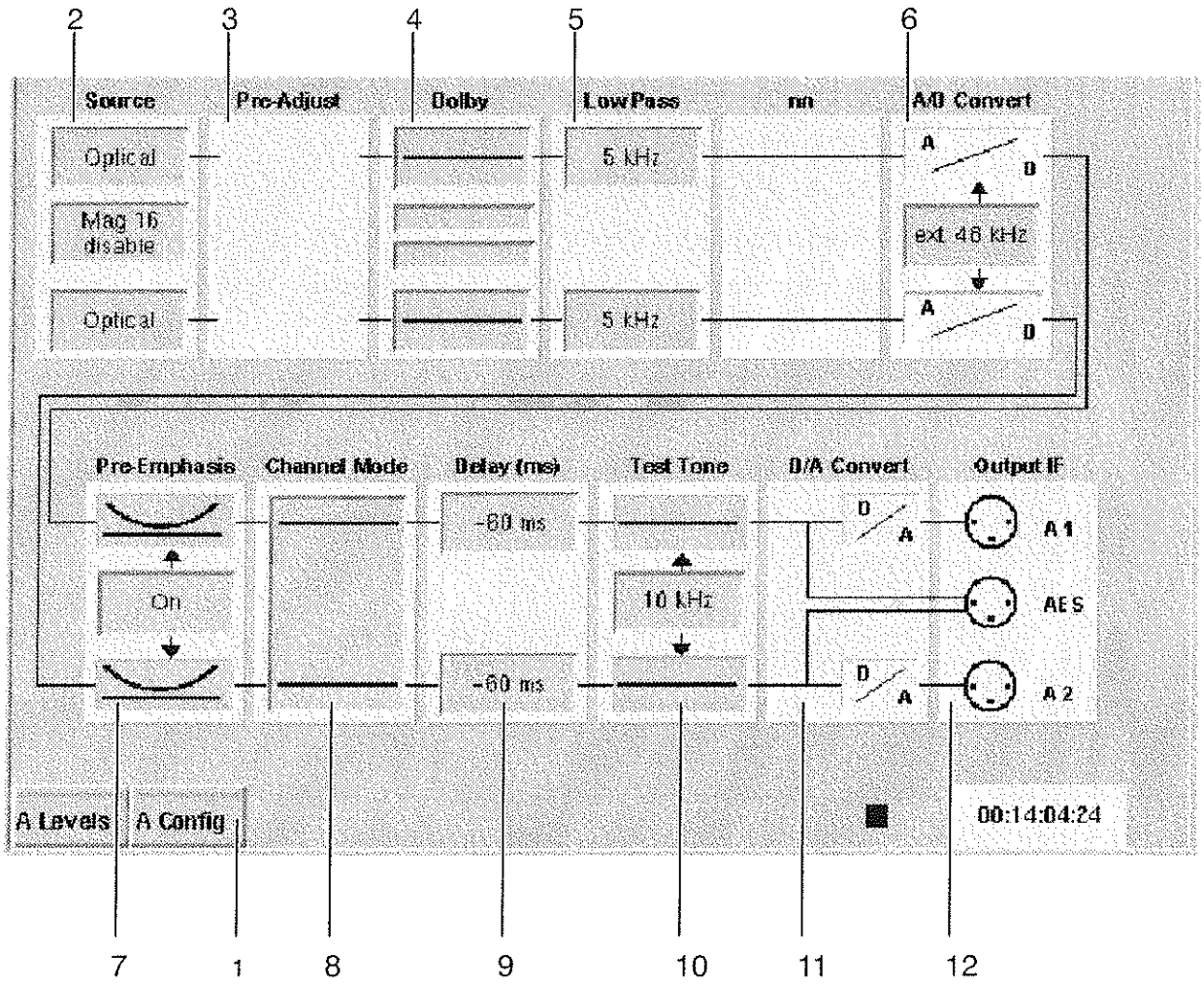


Fig. 450: Audio configuration menu

Overview

Submenu "Audio Config" is selected by pressing dialog key "Audio Config" on the GCP.
This main menu serves to set the configuration of the two audio channels. The channels 1 and 2 form a channel pair.

Audio channels

The Telecine has two digital audio channels which can be used at the output alternatively in an analog or digital form. The digital audio interface "AES" corresponds to the AES/EBU standard.

Audio data format

AES/EBU audio data format
A block of the digital audio output signal consists of 192 audio frames.
The audio frame consists of the subframes A and B with 32 bits each (1 audio frame = 20.83 µ s).

1. Submenu "Audio Config" selection
2. Audio Source selection
3. Pre-Adjust (equalizer & gain)
4. Dolby selection

5. Lowpass filter selection
6. A/D convert synchronization
7. Pre-emphasis selection
8. Channel mode (mono or stereo)
9. Audio delay selection
10. Test tone 1 / 10 KHz Generator
11. D/A conversion
12. Display of the Audio Outputs (symbolized output sockets)
    Two analog and one digital (AES/EBU) outputs.

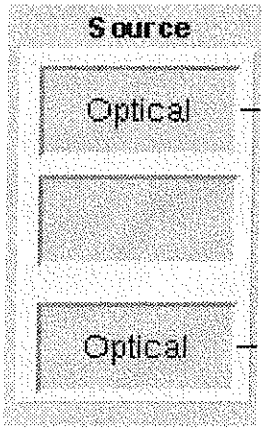
Details of Function Buttons, Controls & Displays

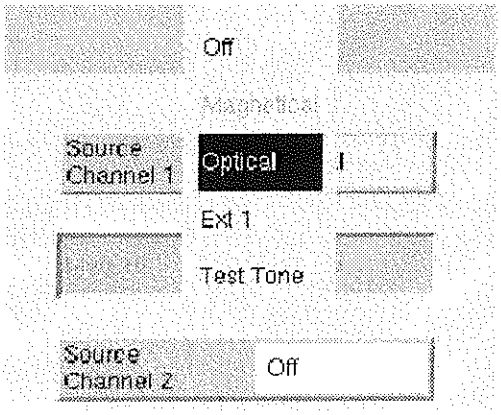
1.

Menu button **"A Config"**

opens dialog **"Audio Configuration"**

2. Source



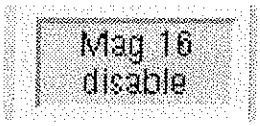


"Channel 1 / 2 source" selection

Click on this section to open the Source selection window.
There you will find a Source Selection key for each channel.
Click on these keys and make your choice from the drop down menu.

The selections for Channels 1 and 2 are different:
Channel 1 can be switched to Off, Magnetical (only for 16mm films), Optical, Ext 1 and Test Tone;
Channel 2 can be switched to Off, Optical, Ext 2 and Test Tone.The current settings are shown on the key display.

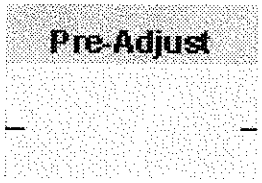
"Off"	Optional muting of an audio channel that is not needed.
"Magnetical"	Selection of magnetical audio for 16mm films.
"Optical"	Selection optical audio for 16mm and 35mm films.
"External 1"	Selection of an external audio source via socket EXT. 1 IN.
"Test"	Internally, digitally produced sine wave tone (1 kHz/10 kHz, 0 VU) for test purposes.



Audio Scanner 1 - COMMAG 16 - can be released

disable	Audio Scanner will be lifted up, audio track will not be scanned
enable	Audio Scanner 1 will be released, ready for operation

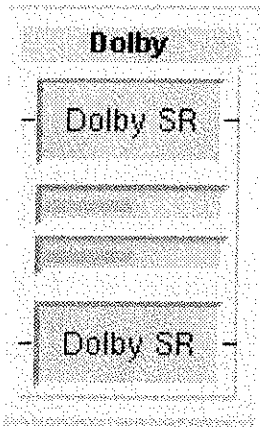
3. Pre-Adjust

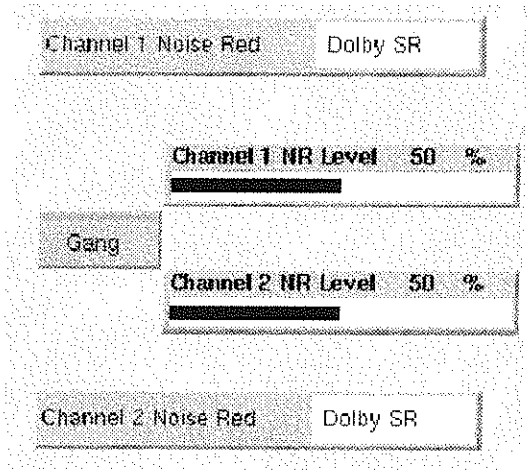


Note!
Adjustments for service personnel only.

This window serves to adjust the film audio input levels and the input equalizers.

4. Dolby





"Dolby" selection

Click on this section to open the Dolby selection window. There you will find a Dolby selection key and a Dolby Level control for each channel.

Click on the keys and make your choice from the drop down menu.

The actual choice is between **None** and **Dolby SR**. Dolby A is not selectable.

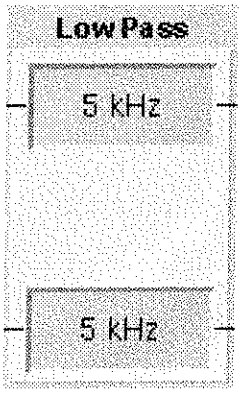
Dolby SR (Spectral recording) refers to an external decoder unit as there is no internal decoder.

Channel 1/2 Noise Red Level control is used to adjust the Dolby output level. Switch on the Dolby test tone of your external device and compare the deflection (see level meter) with what is coming out when you play the Dolby test tone section of your film copy.

Adjust this level until it shows the same reading as the test tone coming from the decoder unit.
To adjust, slide on the touchscreen or use the digipot control (the range is from 0 to 100%).
The current settings are shown on the key displays.

5. Low Pass

"Low Pass" selection



This pull down menu serves to switch on or off lowpass filters in the respective audio channel depending on the film sound.
The two lowpass filters attenuate higher frequencies from 5 kHz.

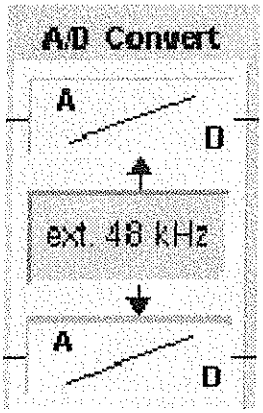
Selection of the lowpass filter for audio channel 1.
The following adjustments are possible:

"Flat (standard setting)"
Film audio channel is not filtered.
Use with good film sound quality.

"5kHz"
Film audio channel is filtered.
Use with bad film sound quality.

6. A/D Convert

"A/D Convert" selection



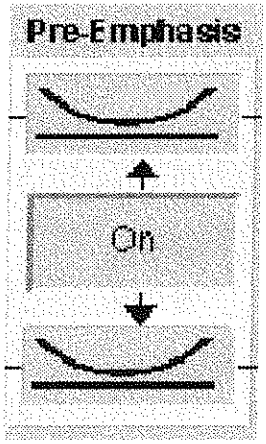
This pull down menu serves to internally or externally lock the audio A/D converter.
The following adjustments are possible:

"Internal Video"
Locking internally.
Locking of the audio A/D converters is made on the internal video signal (standard setting).

"External 48 kHz"
Locking externally.
Use when playing the film sound into an external digital audio studio which is clocked with 48 kHz.

7. Pre-emphasis

"Audio Pre-emphasis" selection



This pull down menu serves to set the preemphasis for both audio input signals (preemphasis: peaking of frequency components before A/D conversion, for improving the signal-to-noise ratio).

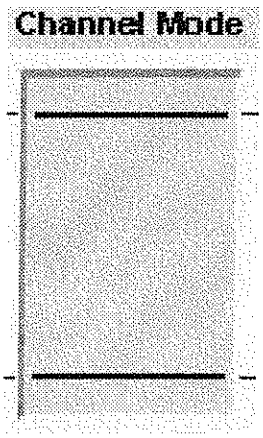
In the digital AES signal, only a preemphasis information is entered in the channel status.
In the analog signal, the frequency response is equalized after D/A conversion in the output stage.
The following adjustments are possible:

"Off" No preemphasis

"On" Switching on the CD-type preemphasis (EQ time constant: 50/15 µ s).

8. Channel mode "Channel mode" selection

This pull down menu serves to define mono or stereo mode (two-Channel). The following adjustments are possible:



"Mono"
One channel operation (only subframe A in the digital signal used)

16mm films have always mono audio tracks.

35mm films may have mono or stereo audio tracks depending on the type.

If a stereo film has to be played in mono mode, both channels are mixed with each other, their levels automatically adapted and distributed to the two audio channels.

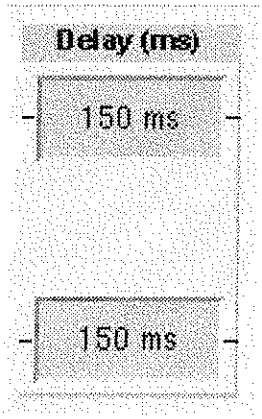
Mono mode should only be used with stereo signal sources selected (e.g. OPT1 and OPT2 in case of 35mm stereo film or EXT1 and EXT2 in case of external stereo devices). With one input switched to OFF (not connected), mono mode is not applicable, i.e. channel routing changes to two-channel mode.

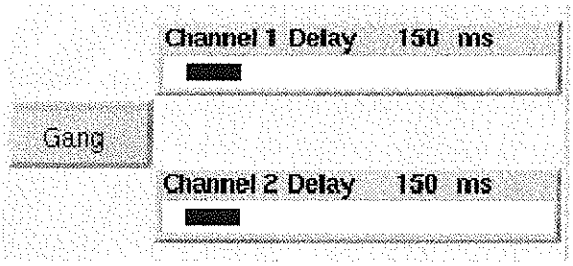
"2 channel (stereo)"
2-channel operation with following allocation of the channels.

Socket	DIGITAL AES/EBU OUT	Channel one Subframe A
Socket	ANALOG AUDIO 1 OUT	Channel one (Left channel with stereo sources)
Socket	ANALOG AUDIO 2 OUT	Channel two (Right channel with stereo sources)

If a mono film is played in the two--channel mode, the 2nd channel can be used for instance with an external SEPMAG signal via "External 1, 2".

9. Audio Delay





"Audio Delay" selection

Click on this section to open the Audio Delay window.

The audio delays which are adjustable in this window compensate picture signal processing time caused by external devices (such as secondary color correctors, noise reducers, etc.).

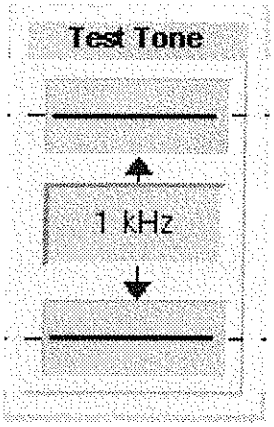
The range is from **-60 to +1000 ms** in steps of 10 ms.

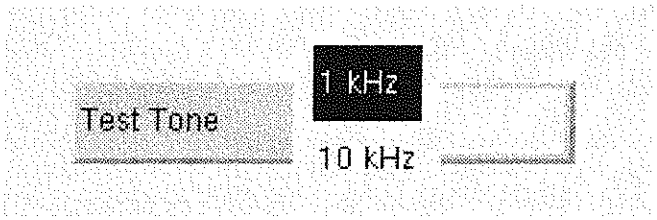
Internal audio delays, different for each film format (in dependence on the pitch between picture and audio scanners), are corrected automatically by the Datacine.

To adjust the delays, slide on the touchscreen or use the corresponding digipot controls.

To exit the window, click on the Close button.

10. Test Tone





"Test Tone" selection

Click on this section to open the Test Tone window.There are 2 different audio test signals available:

1 kHz (standard setting) and **10 kHz.**

This feature can be used for quick check of all involved audio components.

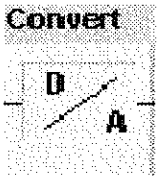
To select, click on the corresponding key.The current setting is shown on the key display.

To exit the window, click on the Close button.

11. D/A Conversion

"D/A" Convert

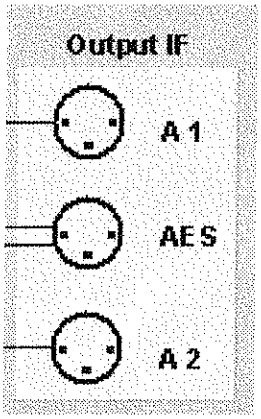
Symbolized the position of digital to analog conversion.



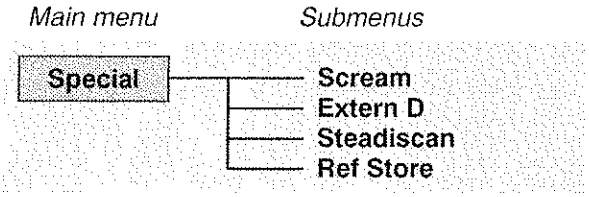
12. Audio Outputs

"Audio Outputs" Display

Symbolized the Audio outputs sockets of terminal panel Rack1.
Two analog and one digital (AES/EBU) outputs.



4.9 SPECIAL MENU



4.9.1 SUBMENU SCREAM

Menu button **"Scream "**

opens dialog **"Scream - Grain Reducer"**

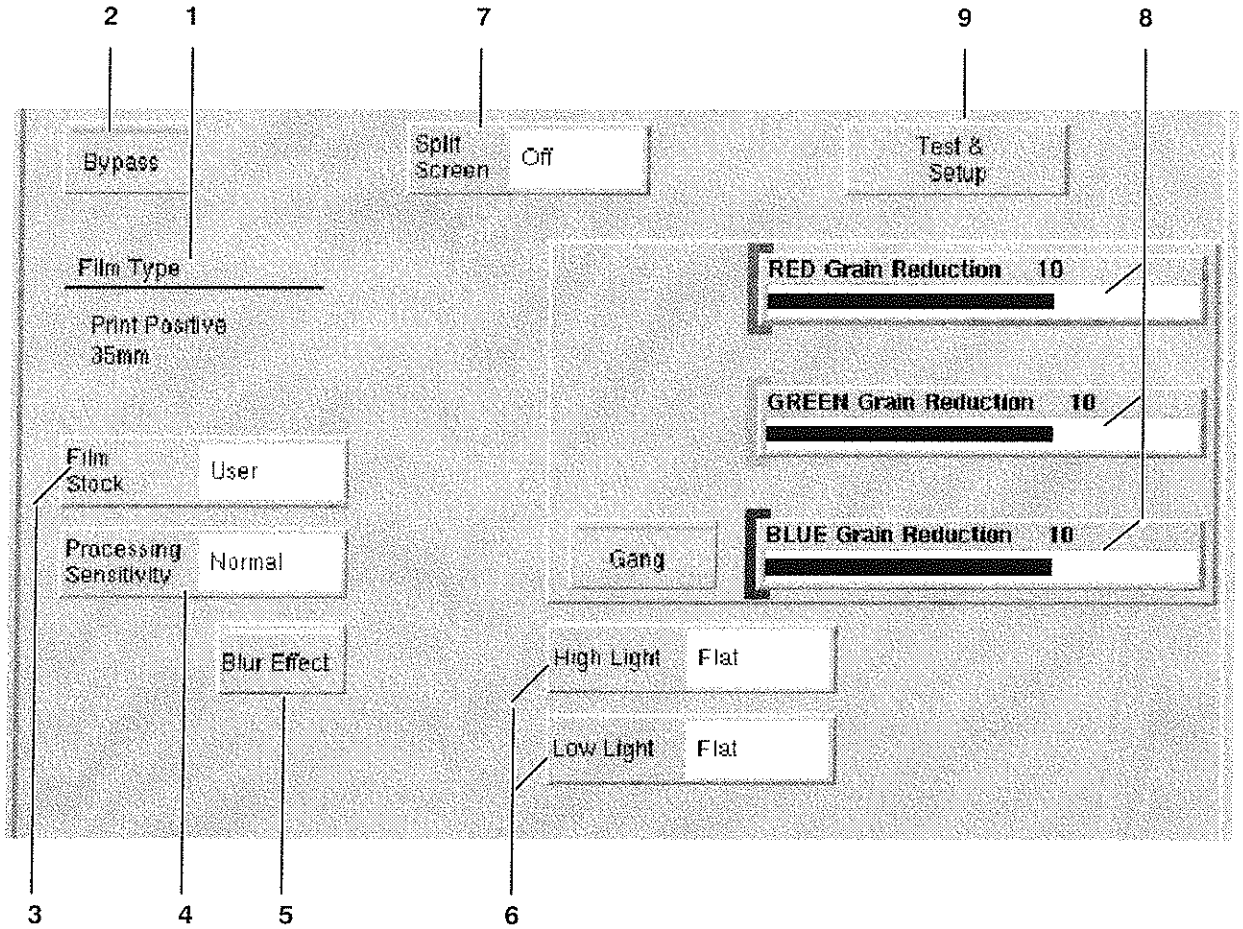


Fig. 451: Menu Scream

Overview

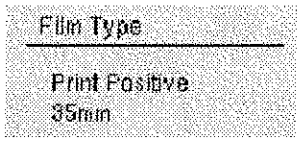
The SCREAM grain reducer has to be looped in between Rack 2 and Rack 3 connection. If a Pandora MegaDef system is present, the SCREAM has to be installed prior to the MegaDef unit.

The grain reduction functionality of SCREAM is only available in play mode, not in stop mode. The SCREAM is a resolution and format independent grain reducer.

1. Film Type Display
2. Bypass
3. Film Stock Selection
4. Processing Sensitivity
5. Blur Effect
6. High and Low Light
7. Split Screen
8. Grain Reduction RGB Sliders & Gang
9. Test & Setup

Details of Function Buttons, Controls & Displays

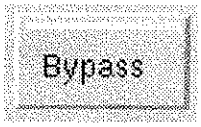
1. Film Type Display



Informs about the film material which is currently laced up on your telecine.

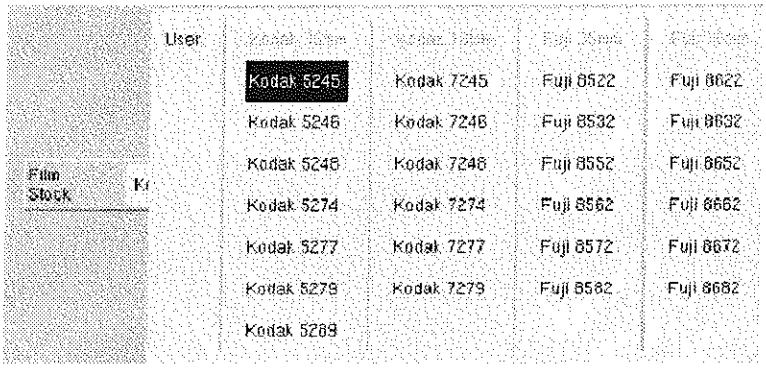
Note: In case the SCREAM is not connected or switched off, the display turns red and it reads "not connected".

2. Bypass



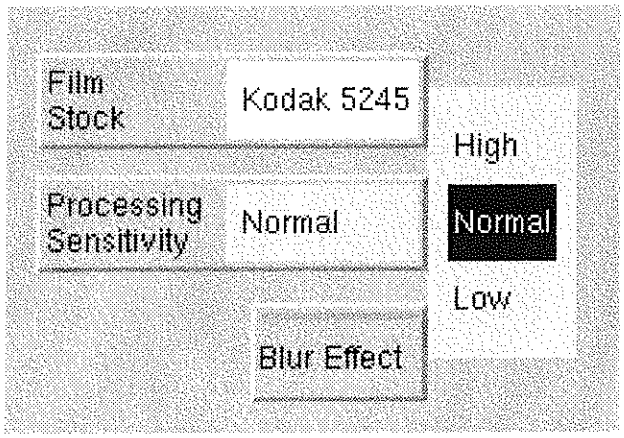
If you want to be sure to look at a picture which is not affected by the SCREAM, click on the **Bypass** button. Bypass is enabled when the bar on the key is yellow. The delay of SCREAM does not change when you are in Bypass mode. It remains at 1 film frame delay.

3. Film Stock



The **Film Stock** menu enables to select different film stocks of Kodak and Fuji for 35mm films and 16mm films.
Each film stock has different granularity characteristics in the different dye layers and requires a relative weighting of the amount of grain reduction applied to the 3 channels.
The Scream has these adjustments preprogrammed for the most popular film types. Film grain reduction is automatically adjusted for all 3 channels and can subsequently also manually be changed.
This is particularly useful for blue or green screen transfers where a higher degree of noise reduction may be desirable in the background key colors (blue of green).

4. Processing Sensitivity



The threshold of the Recursive filter processing can be modified with the Processing Sensitivity key.

Three different settings are selectable: **Low, Normal, High**.

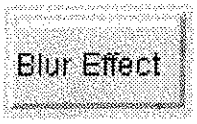
Click on the key and make your choice from the drop-down menu. The current setting is shown on the key display.

Low stands for low motion thresholds (i.e. high suppression of the filtering). Motion detection in this setting works very sensitively and therefore effectively suppresses grain reduction in dependency on the picture content. The more movement in the picture, the less grain reduction is applied in order to avoid artifacts.

Normal stands for well-balanced grain filtering and suppression by the motion detector.

High stands for high motion thresholds (i.e. low suppression of the filtering). Motion detection in this setting is quite insensitive, therefore grain reduction works very effectively although there is movement in the picture.
Be careful with this setting as artifacts may occur!

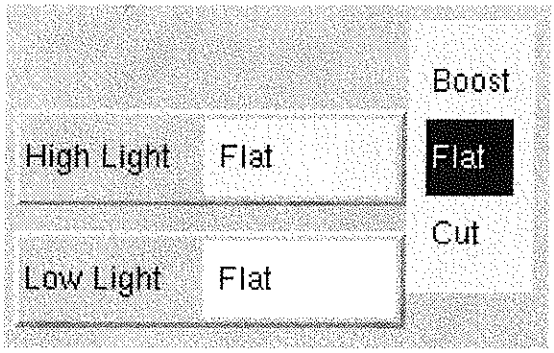
5. Blur Effect



If this button is enabled, indicated by a yellow bar, the internal motion detector is switched off.
This feature should not be used in standard operation as it causes smearing artefacts at moving objects in the image and is therefore exclusively to be applied for artistic effects.

In case of no movement in the picture (e.g. packshot) **Blur** can be applied to achieve a high performance filtering.

6. High & Low Light

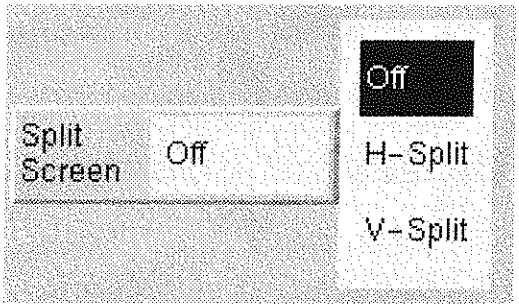


As signal to noise ratio of film related material is not constant with respect to the level two additional controls for fine tuning the noise reduction are provided:

High Light:
This control modifies the strength of noise reduction in bright areas of the image. Possible settings are **cut** (decrease of noise reduction) **flat** (no change) and **boost** (increase of noise reduction) to adjust noise reduction in bright areas.

Low Light:
This control modifies the strength of noise reduction in dark areas of the image. Possible settings are **cut** (decrease of noise reduction) **flat** (no change) and **boost** (increase of noise reduction) to adjust noise reduction in dark areas.

7. Split Screen



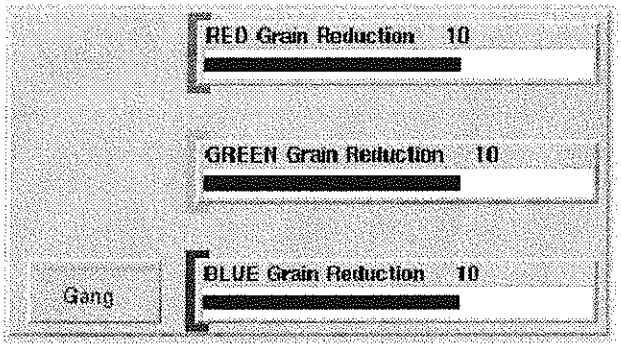
A horizontal (H-Spilt) or vertical (V-Split) screen split function can be activated with this button.

This function is a tool to compare the filtered half (right or bottom) of the picture with the non-filtered half (left or top).

Click on the button and make your choice from the drop-down menu.

Of course your choice will depend on the picture content. The current setting is shown on the key display.

8. Grain Reduction & Gang



The RGB sliders form a new feature for even more specific grain reduction. The strength of grain reduction can be set here individually for each color channel.

The range is from 0 to 15 in steps of one.

To modify, slide on the touchscreen or use the soft pot control.
The current setting is displayed as a bar graph with the corresponding values on top. There may be need for such specific settings as film material consists of layers containing silver halogenous grains sensitive for red, green and blue light.
Later on they react with the corresponding dyes (yellow, cyan and magenta) to create a colored picture.

Different layers may respond in different ways to sensibilization, exposure and processing and therefore the impression of granularity may differ from one layer to another.

With the SCREAM there is no need for grain filter type selection (Transversal, Recursive, etc.).

According to the filter strength setting of the RGB channels, grain filter selection is automatically performed.

TRANSVERSAL FILTER (roughly) works according to the following method:
The output pixel is averaged (median value) from the same pixels of three successive pictures and the vertically adjacent pixels of the center frame.
This filter works with a constant quality, no matter how far away from a scene change event.

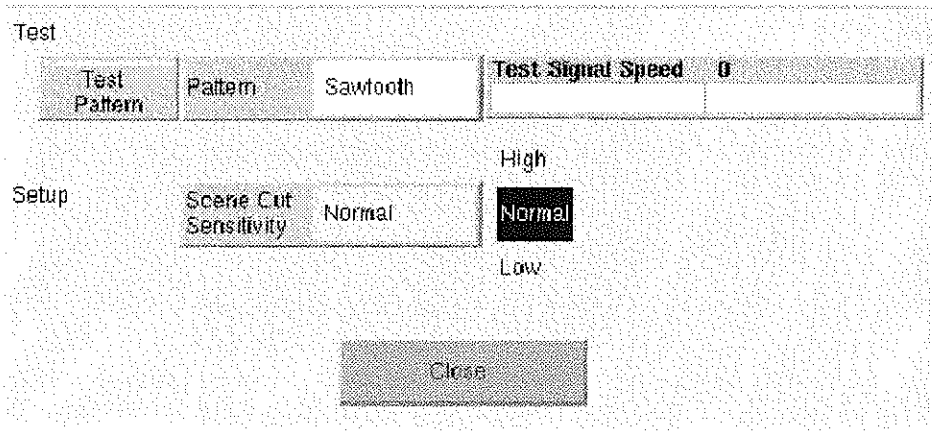
RECURSIVE FILTER (roughly) works according to the following method:
The averaging of the output pixel here is a process, involving pixels of all preceding pictures after the last scene change up to the current picture.

The output pixel averages the current pixel with the same, already averaged pixel of the previous picture which itself already is the average of the previous recursion.

That is why this filter of course works much stronger than the Transversal Filter (be careful: in some cases maybe even too aggressive for your desired application) but with increasing effect the further you get from the last scene change.

Gang
This button concertedly controls a group of keys. With GANG activated (green bar on the key is lit) the strength parameter slider of grain reduction in all three channels (RGB) is modified by touching only one of the controls.

9. Test & Setup



When **Test Pattern** is enabled, the yellow bar on the key is lit.

By pressing the adjacent **Pattern** Key, a drop-down menu opens containing all available test patterns (here: Color Bars, Multiburst, Black and Sawtooth).

To select a pattern, click on it. The current selection is shown on the key display. If it reads "TK Pattern", a telecine test pattern is active.

Test signal speed is only available in conjunction with the **Sawtooth** pattern. It controls the horizontal movement of the Sawtooth pattern. To change the speed, slide on the touchscreen or use the digipot control.

Scene Cut Sensitivity
With this key, the sensitivity of the built-in scene change detector can be modified.

The standard setting is **Normal.**

In case the film material you are working with consists in a number of scenes which hardly vary, it is recommended to switch the sensibility to **HIGH.**

In this case even small changes in picture content will be considered.

When "taking" old print films with flicker and jumping transitions rather choose **Low** to avoid events where there aren't any.

To change, click on the key and choose from the drop-down menu. The current setting is shown on the key display.

4.9.2 SUBMENU EXTERN D (DEVICES)

Menu button **"Extern D "**

opens dialog **"Extern Devices"**

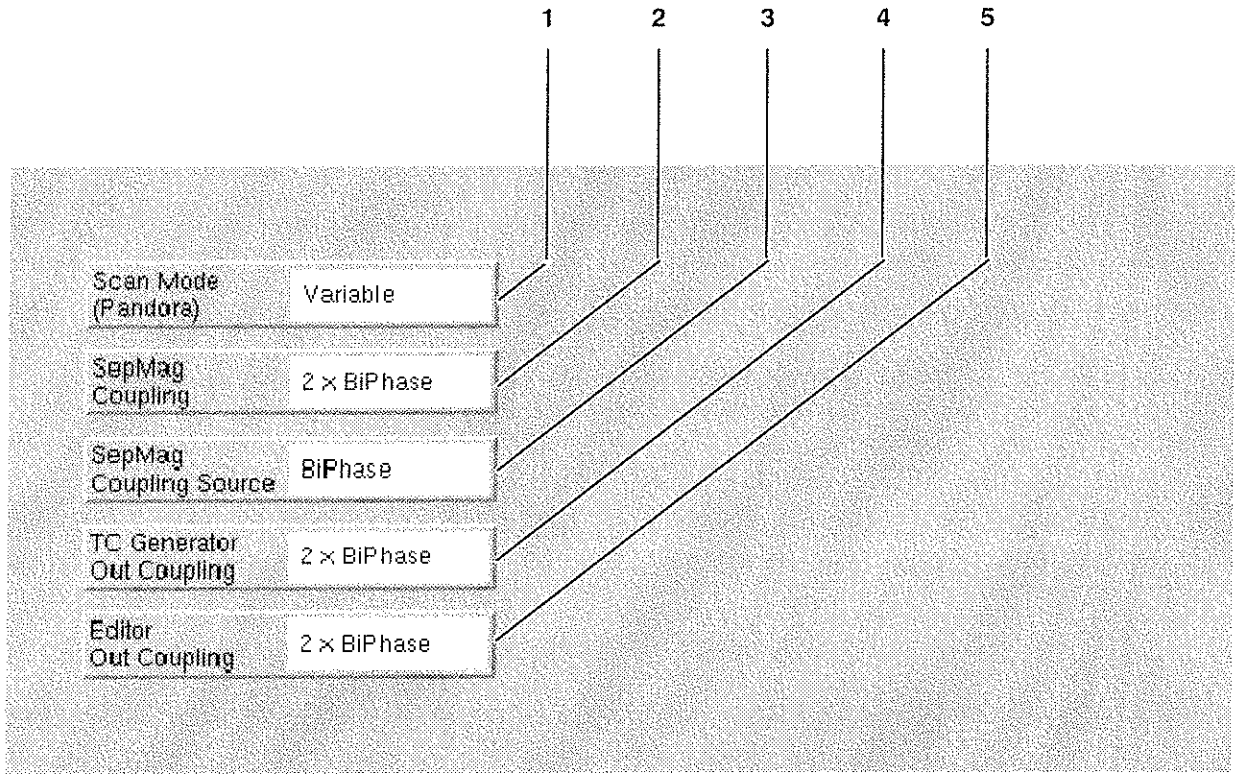


Fig. 452: Submenu "Extern D"

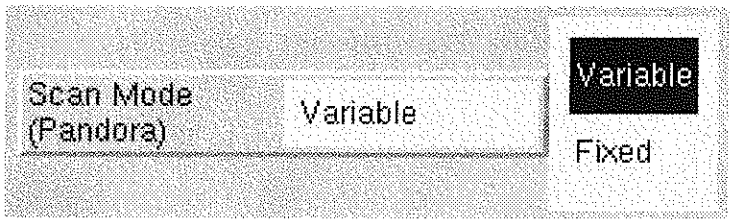
Overview

This menu contains various setups which are needed in combination with external devices.

1. Scan Mode (Pandora MegaDef selection)
2. SepMag Coupling
3. SepMag Coupling Source
4. TC Generator Out Coupling
5. Editor Out Coupling

Details of Function Buttons, Controls & Displays

1. Scan Mode

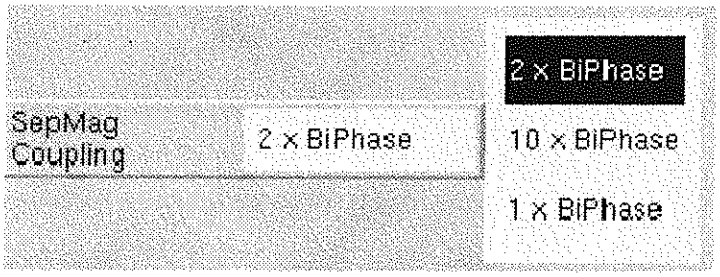


Scan mode can be switched between **Variable** and **Fixed**.

This setup is needed in particular for the MegaDef Color Corrector from Pandora.
The standard setting is **Variable** but with a MegaDef plugged in between Rack 2 and Rack 3 it has to be switched to **Fixed**.

Fixed assures that the number of scanned lines is constant, no matter whether you are working with a 50Hz or with a 60Hz standard (video or data).
Click on the key and select from the drop down menu.

2. SepMag Coupling

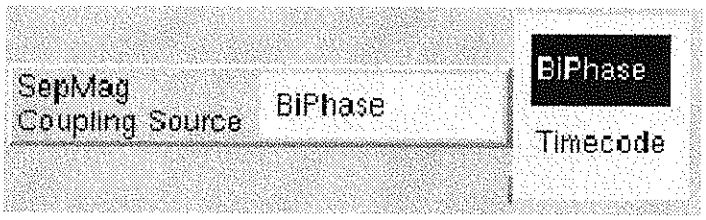


Biphase signals are generated internally by dividing down pulses coming from the sprocket wheel.
Here the Biphase signal is used to synchronize external SepMag units.

It can be switched between **2x Biphase** (48/50Hz), **10x Biphase** (240/250Hz) and **1x Biphase** (24/25Hz), referring to the SEPMAG OUT connector of Rack 2.

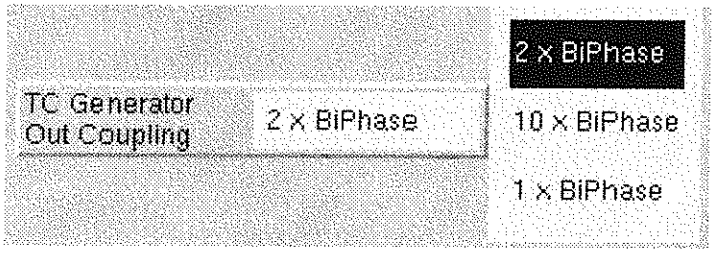
To find out the correct setting, check manual of connected device.
To modify, click on the key and select from the drop down menu.
The current setting is shown on the key display..

3. SepMag Coupling Source



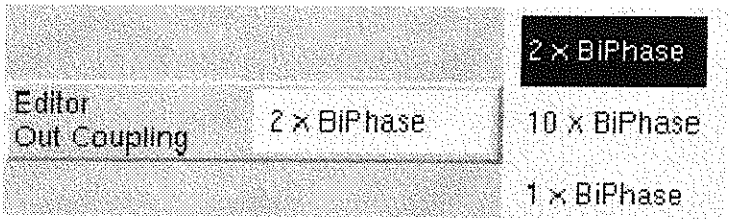
SepMag players can either be synchronized on **BiPhase** or **Timecode** signals generated by the DataCine.
Audio Delay is set to 'Zero' in case a SepMag player is coupled via Timecode with the DataCine and the audio outputs from the player are connected to "Audio In" of the SDC.
The audio output of the DataCine then has a correct timing to the video signal.
To modify, click on the key and select from the drop down menu. The current setting is shown on the key display.

4. Timecode Generator Out Coupling



Biphase signals are generated internally by dividing down pulses coming from the sprocket wheel.
Here the Biphase signal is used to synchronize external time code units (e.g. keycode reader).
It can be switched between **2x Biphase** (48/50Hz), **10x Biphase** (240/250Hz) and **1x Biphase** (24/25Hz), referring to the TC GEN OUT connector of Rack 2.
To find out the correct setting, check manual of connected device. To modify, click on the key and select from the drop down menu. The current setting is shown on the key display.

5. Editor Out Coupling



Biphase signals are generated internally by dividing down pulses coming from the sprocket wheel.
Here the Biphase signal is used to synchronize external editor units (e.g. Pogle).
It can be switched between **2x Biphase** (48/50Hz), **10x Biphase** (240/250Hz) and **1x Biphase** (24/25Hz), referring to the Editor Out connector of Rack 2.
To find out the correct setting, check manual of connected device.
To modify, click on the key and select from the drop down menu.
The current setting is shown on the key display.

4.9.3 SUBMENU STEADISCAN

Menu button **"Steadi S "**

opens dialog **"Steadiscan"**

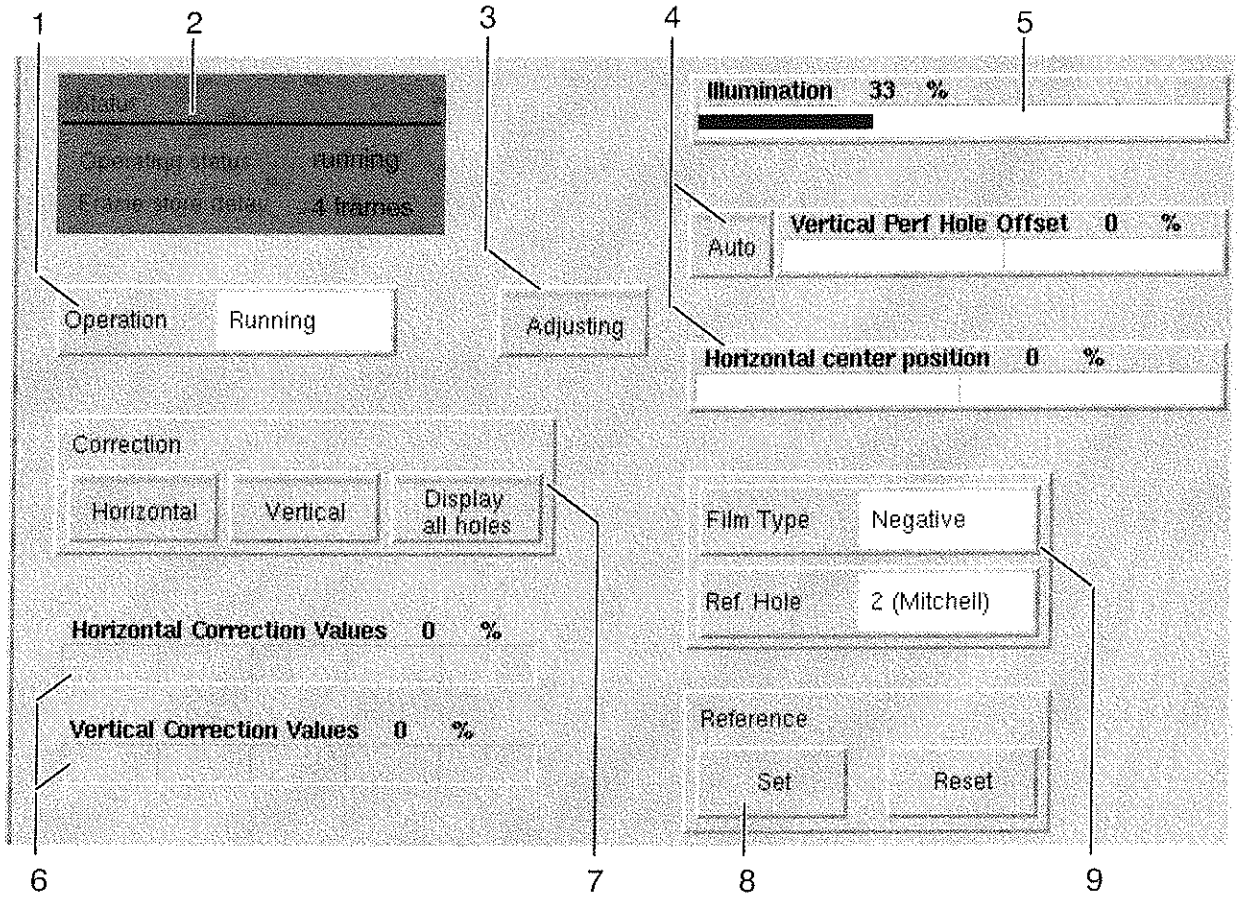


Fig. 453: Submenu Steadiscan

Overview

This submenu serves to set the Steadiscan parameters.

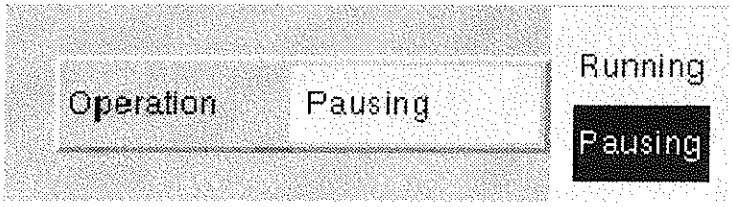
Note! The Option "Steadiscan" a film staedines improvement system is required.
For installation details , refer to the separate user manual "Steadiscan"

1. Steadiscan operation mode button
2. Frame store delay and operation status field
3. Button "Adjusting" displays the rulers of the reference perforation hole
4. Button "Auto" performs perf hole vs. vertical ruler offset adjustment
   & Slider for vertical perf hole vs. vertical ruler offset (manual adjustment)
   & Slider for horizontal center position of the rulers vs. perf hole
5. Slider for illumination level control of the perforation hole
6. Bar graphs for H & V correction values
7. Selection of Steadiness - Correction H & V and Display all holes

8. Buttons for Reference Set & Reset
9. Area of film type refence hole (P or N) and selection of reference perforation hole for a 35mm image
   Detailed descriptions see the next paragraphs!

Details of Function Buttons, Controls & Displays

1. Operation mode

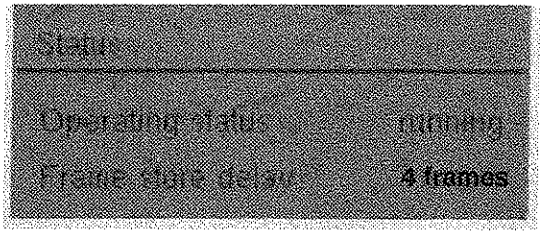


Operation
Selects Steadiscan operation mode

Pausing no Steadiscan correction is performed

Running Steadiscan is working

2. Status Operating & Frame Store Delay



Operating status
shows the Steadiscan operating status:

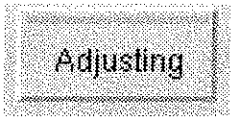
pausing	no Steadiscan correction is performed
running	Steadiscan is working
adjusting	appears during adjustment of perf offset or ruler area
not initialized	appears during Steadiscan initialization

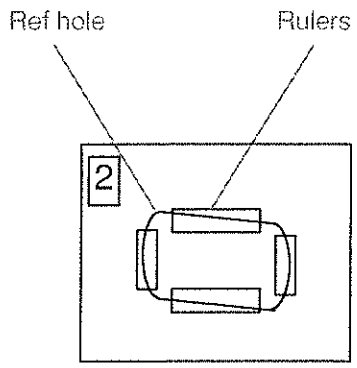
Frame store delay shows the SDC signal delay
1 frame without Steadiscan operation
4 frames if Steadiscan is running

The frame store delay, compensating the computing time of Steadiscan, is automatically switched on and off by the Film Deck Controller depending on wether Steadiscan is running or not.
Frame store delay depending on Steadiscan- and SDC operation:

frame store delay (field 2)	Steadiscan op - status (field 3)	SDC op - modes
1 frame	pausing	stop, reverse
4 frame	running	film speed ≤ 6.25 fps forw.

3. Adjusting



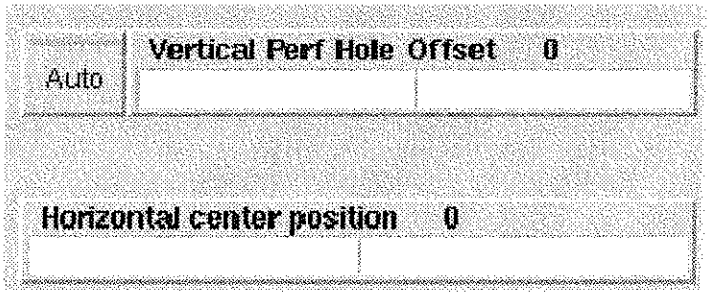


Adjusting
Displays the rulers of the refence hole at the VGA monitor

4. Auto

Vertical Perf Hole Offset

Hor. center position



Auto
Auto adjustment **on** / **off** for vertical perf hole offset vs. vertical rulers.

Vertical Perf Hole Offset
Manual adjustment of the vertical perforation hole vs. vertical rulers on top & bottom.

Performing via touching the slider or use the corresponding digipot control.

Horizontal center position
adjustment of horizontal rulers (left & right) vs. perf hole.

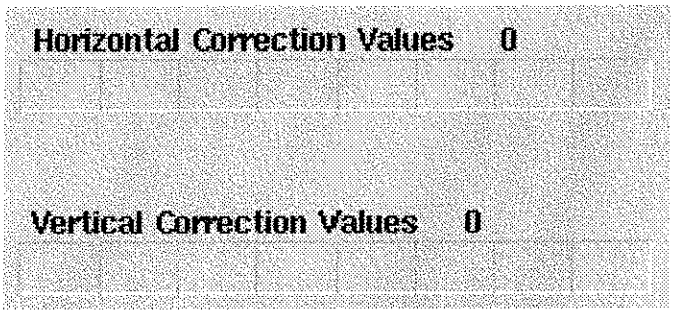
Performing via touching the slider or use the corresponding digipot control.

5. Illumination

Illumination
level control of the perforation hole.

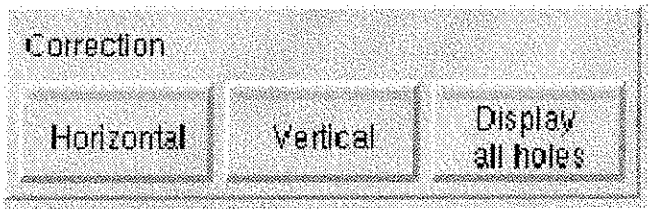
The illumination slider controls the light source which is installed in the film gate.
For adjusting, slide on the touch screen or use the corresponding digipot control.
Details , see also chapter 4.9.3.1 "Illumination level adjustment" in this manual.

6. H & V Correction Values



This bars show the amount of the measured and compensated unsteadiness.

7. Correction



Correction
selects H or V Steadiscan correction

Horizontal on / off

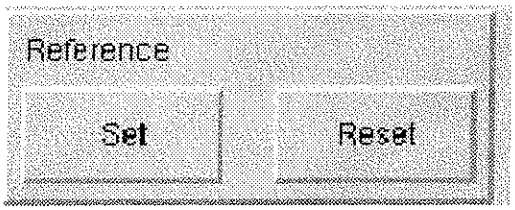
Vertical on / off

Correction is active when the green bar on the button is lit.

Display all holes on / off

In this mode, the program shows all perforation holes, but does not perform Steadiscan correction. This mode can left by typing the button again or selecting a **Ref - Hole**. In this case, initialization starts again.

8. Reference

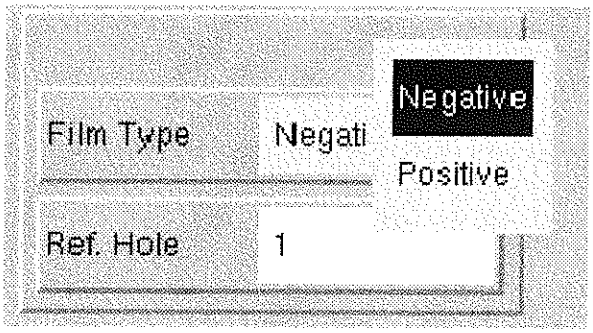


Reference

"Reference Set"
sets the position of the actual frame as reference for the (relative) Steadiscan correction vectors.

"Reference Reset"
sets the default reference center points of the horizontal and vertical rulers.

9. Hole Type & Reference Hole



Hole Type
Selection of film type refence hole: **Positive** or **Negative**.

The system is able to handle type N (BH = Bell & Howell) and type P (KS = Kodak System) perforation holes.
If pressed during measurements, operation is aborted and the system will be re-initialized.

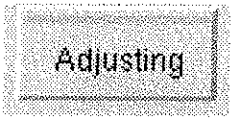
Ref. Hole
selection of reference perforation hole for a 35mm image
(1, 2, 3, 4; - 2= Mitchell hole)

4.9.3.1 STEADISCAN ADJUSTMENTS

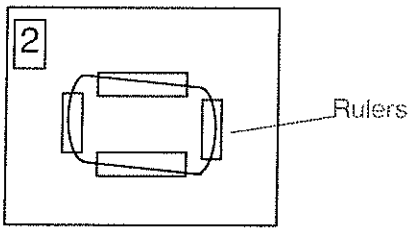
Ruler Adjustment

During initialization the rulers left and right can be adjusted via horizontal cursor keys. This may be necessary in the horizontal direction when another film has been threaded.

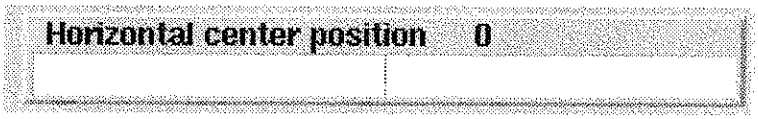
First press "Adjusting" button



The rulers of the perf hole are displayed at the VGA monitor

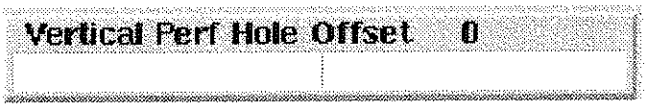


Bottom and top rulers are fixed symmetrically to the center of the displayed frame.



In case of local control via PC, press ENTER when finished and the new ruler position will be stored on disk.

Perforation offset adjustment



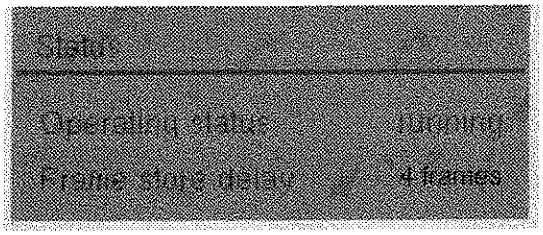
Adjustment of perforation offset is performed via the digipot controls and is also controllable via the PC keyboard (cursor-, ctrl-, return-key used). The position is displayed on the VGA monitor.
Adjustment of vertical offset (also called perforation framing) can be done during initialization in both, display mode as well as in run mode.
In the latter, the system pauses the measurement when the adjust-offset-key is pressed and goes into adjust mode indicated by displaying the rulers representing the measurement areas over the perforation hole. After a time-out of two seconds it continues the measurement.

Self-calibration of the perforation framing is done if adjust-mode is **"AUTO"**.
Adjust mode "**AUTO**" - is useful for unattended longform transfer and defining perforation offset.

Changes in film framing are compensated automatically by changing the perforation framing. During adjustment, Steadiscan correction is interrupted.

If perforation offset is obviously out of range, press "AUTO" button.

Perforation offset will be optimized by the system after op-status (field 1) "running" is reached.



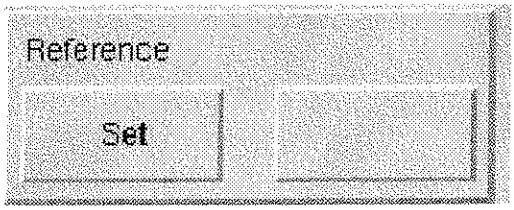
Press again the "AUTO" button to de-select auto mode. This avoids an automatic re-adjustment of the perforation offset, e.g. during transportation of the film leader.

Reference frame setting

The H/V-correction-values, sent to the SDC spatial processor, are relative to the position of a reference frame. They represent the deviation of the current frame from the reference frame.

The position of the reference frame has to be set by the user

(via Reference SET - or locally by the 'R' key)



during measurement after the servo of the SDC 2000/2001 is absolutely stable (60 frames after servo has locked).

To ensure that the first frames, following the leader, are corrected properly, the rulers have to be adjusted with the beginning of the film and not with the leader.
To start the correct film transfer, rewind into the leader section and start the transfer mode. This minimizes the constant offset which is contained in correction values.

Please notice, if several pieces of film shall be scanned sequentially and overlaid afterwards, that setting the reference shall be done only once with the first film.

Otherwise, there are displacements in the overlays because of the different offsets in the scanning sessions.

All user parameters are saved on harddisk and restored at program initialization.

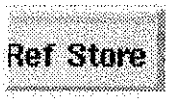
Illumination adjustment

Perforation hole illumination adjustment

If white dots or white vertical stripes , caused by camera saturation, appear in the displayed hole image, reduce the illumination level until dots and stripes disappear. Perform adjustment by sliding on the touchscreen or use the digipot.

If vertical stripes of various colors appear in the VGA display, the illumination window has to be cleaned. See chapter "Maintenance" in the separate Steadiscan manual.

4.9.4 SUBMENU REFERENCE STORE



Menu button **"Ref Store "**

opens dialog **"Reference Store"**

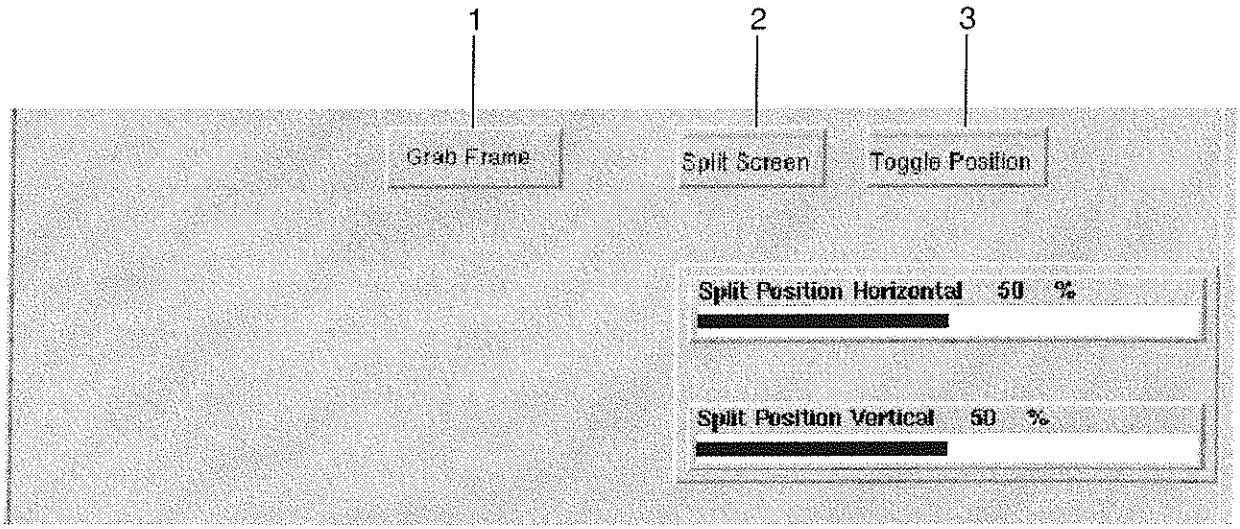


Fig. 454: Submenu Ref Store

Overview

Submenu **Ref Store** allows to store a scanned image in a reference store. This image can be a film, data or television frame in HD or standard definition resolution.

Splitted Screen with H & V wipe of the reference stored image

Fig. 455: Split screen

The operator can wipe horizontally and vertically between the stored reference frame and the live frame for color matching.

Select a defined image in STEP mode and store this into the reference buffer by pressing the button 'Grab Frame'. This function is not programmable via an external editor.

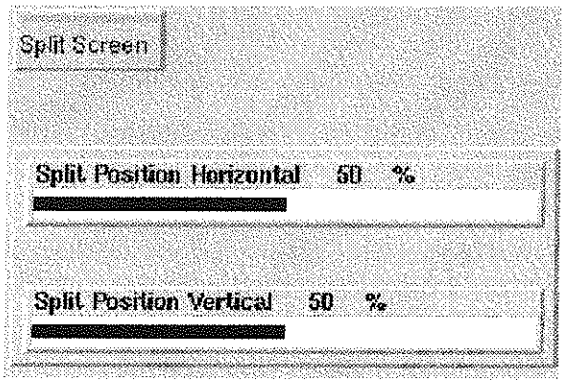
10. Grab Frame serves to store a film frame into the refence store
11. Split Screen serves to provide a two image presentation in one frame
12. Toggle Position

Details of Function Buttons, Controls & Displays

1. Grab Frame

Operation
Press the button **Grab Frame** to store a scanned frame. It is visible at the appropriate outputs HDTV or SDTV alternatively at the Data Out.

2. Split Screen



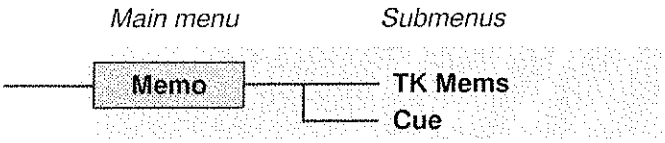
Split Screen
Button **Split Screen** activates the two frames presentation depending from the horizontal and vertical Split Position sliders.

Split Position Horizontal & Vertical
Adjust the horizontal and vertical wipe. To modify, slide on the touch screen or use the corresponding digipot control.

3. Toggle Position

Toggle Position
exchanges the stored frame with the actual frame.

4.10 MENU MEMO



Menu button **"TK Mems"**

opens dialog **"TK Memories"**

/4.10.1 SUBMENU TK MEMS

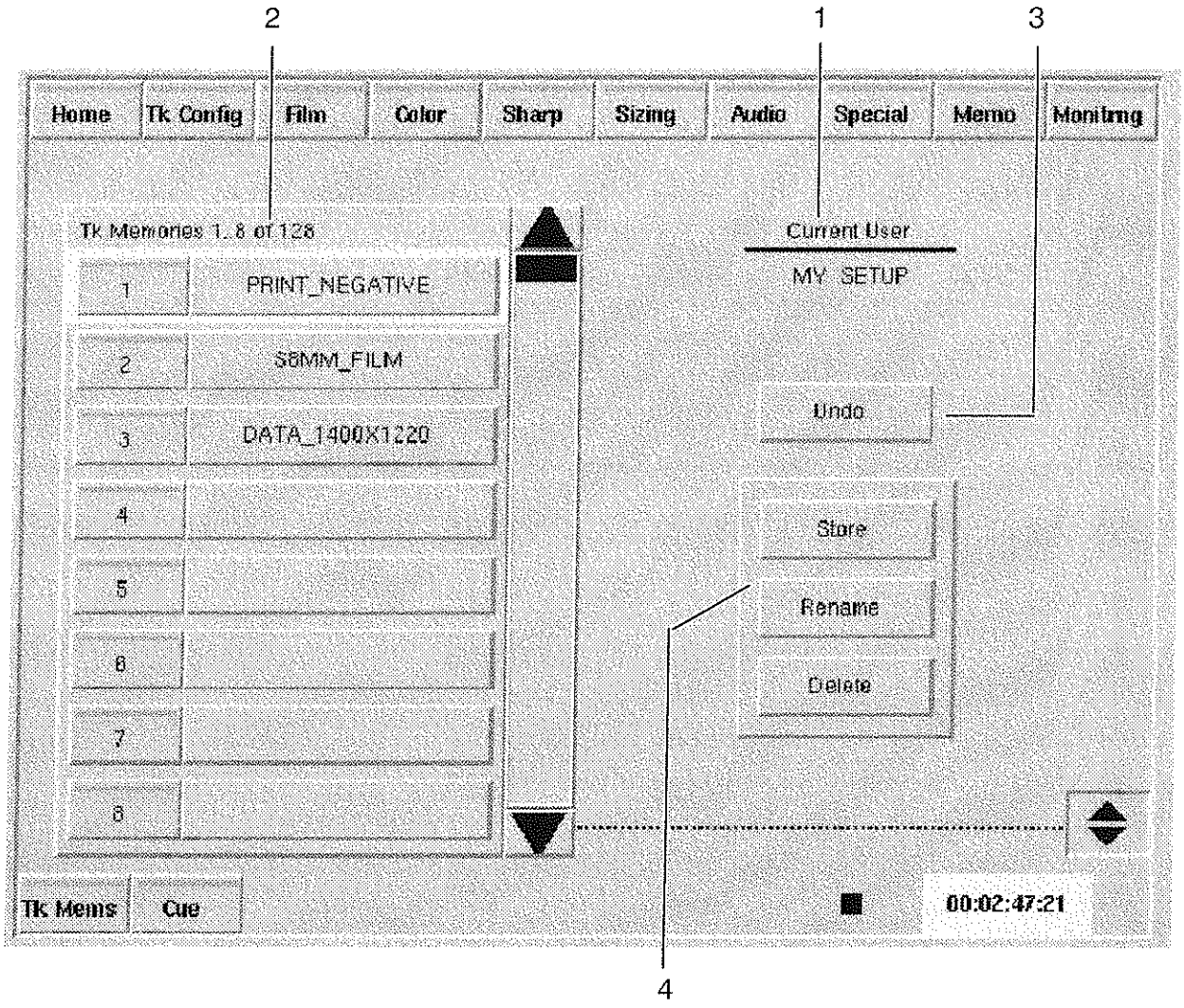


Fig. 456: Submenu **"TK Mems"**

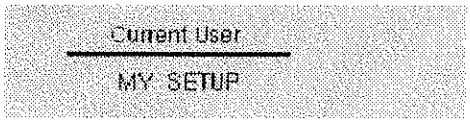
Overview

The submenu TK Mems serves to store DataCine settings. Each user can store up to 128 settings. The GCP file system allows user as many as you like.

1. Window "Current User"
2. TK Memories (setups) 1 - 128
3. Store, Rename, Delete buttons to perform a setting
4. Undo / Redo button

Details of Function Buttons, Controls & Displays

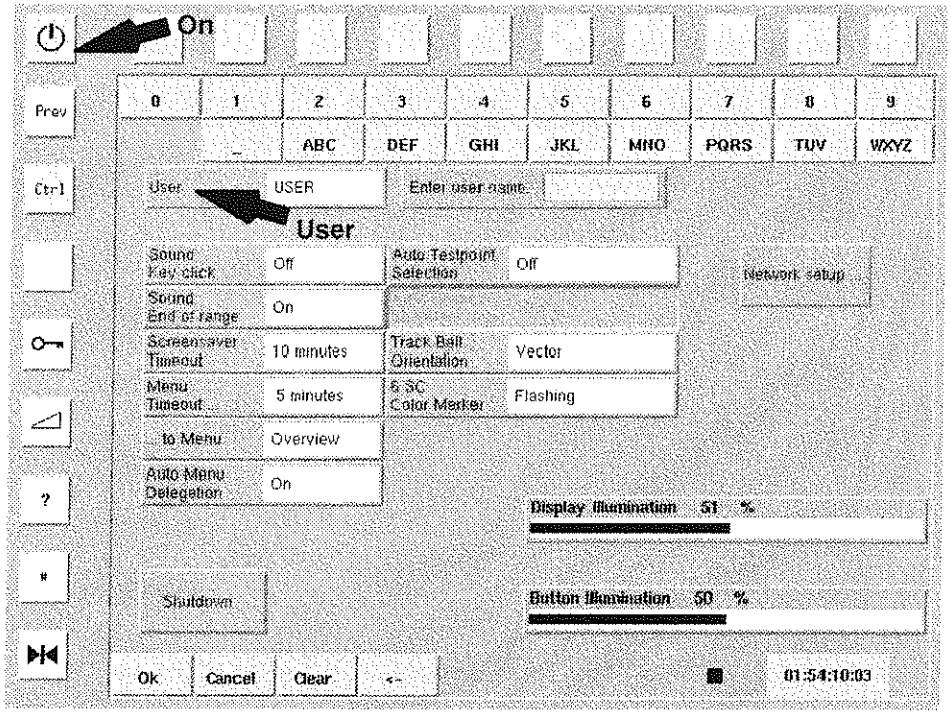
1. Current user



This window shows the current user of the **TK Mems**.
The user can be defined and selected in the login menu.

Press the **"On"** button to open the login menu.

Actuate the **User** button in the **Login** menu.



To select or set a new user make the corresponding choice (new user, delete user, Factory reset).

A two lined keyboard and the concerning action buttons will be opened.

Type in the name for the new user and confirm by pressing the **OK** button at the bottom of the dialog.

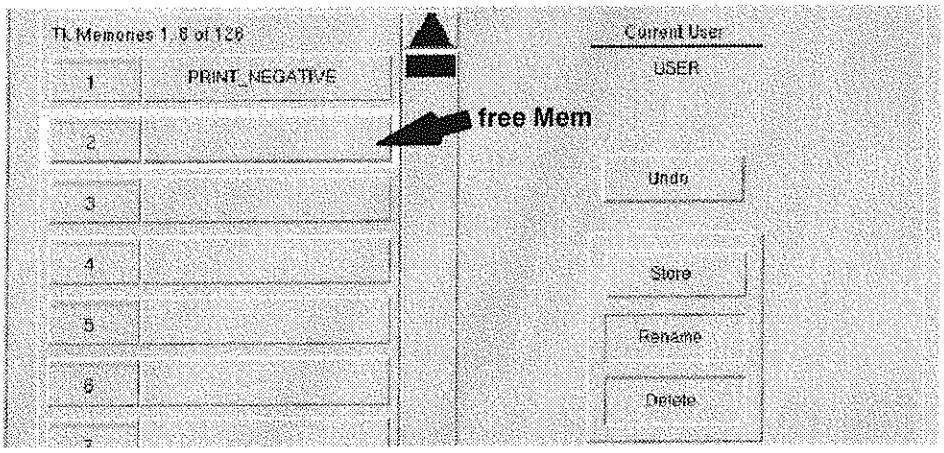
2. TK Mems

The currently selected **TK Mem** is shown with an orange frame. Select another Tk Mem with the designated digipot.

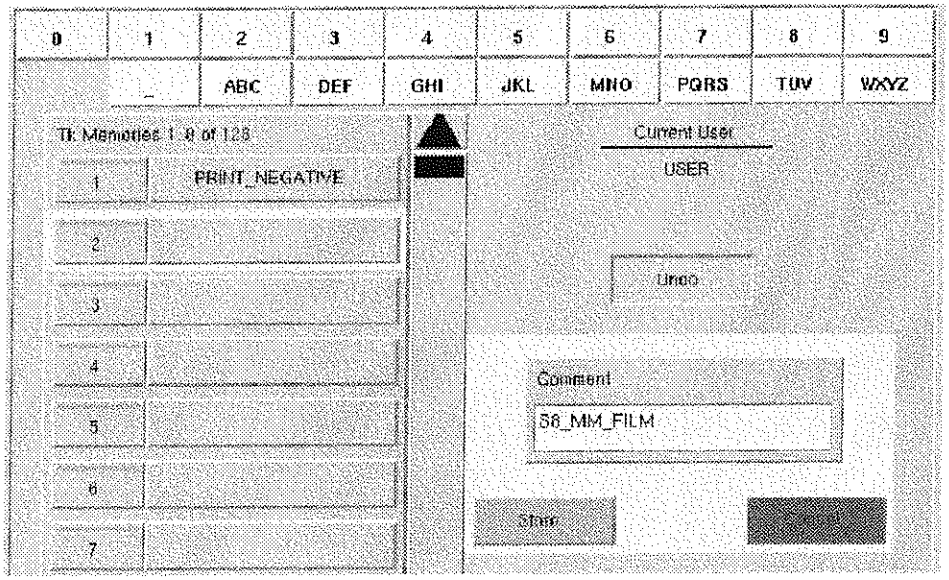
They are recalled by touching the Mem on the screen, either the number (1-128) or the name. The last recalled Mem is indicated by a green bar above the number.

To set a new TK Mem select a free TK Mem button.

Actuate the **Store** button and set a comment to the corresponding TK Mem

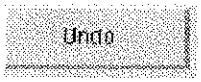


A two lined keyboard and the concerning action buttons will be opened to set a comment.



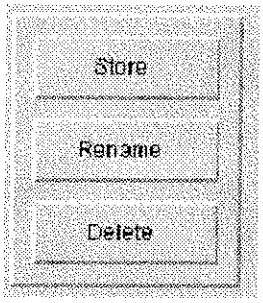
Type in the comment for the new TK Mem and confirm by pressing the **OK** button at the bottom of the dialog.

3. Redo / Undo



With the **Undo / Redo** button the user can toggle between the recalled Mem and the previous Tk settings.

4. Action buttons



Store
Tk Mems are stored with the **Store** button. A dialog appears where the user can change the default name of the Tk Mem. The Tk Mem is stored after pressing the Ok button.

Rename
Tk Mems are renamed with the **Rename** button. A dialog appears where the user can change the name of the Tk Mem.

Delete
Tk Mems are deleted with the **Delete** button.

/4.10.2 SUBMENU CUE

Menu button **"Cue"**

opens dialog **"Cue"**

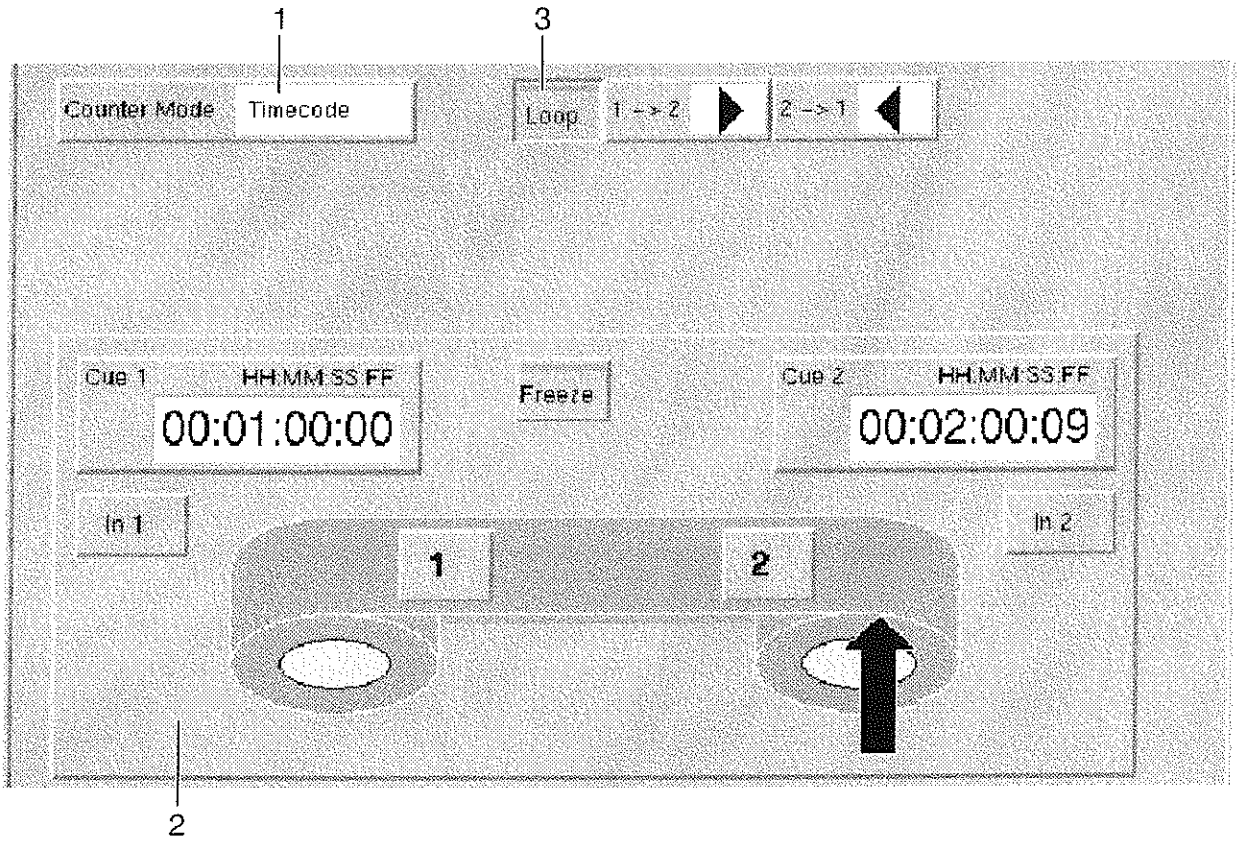


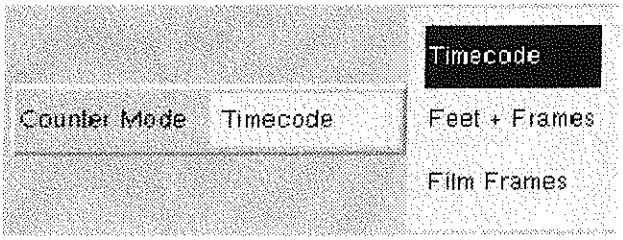
Fig. 457: Submenu **"Cue"**

Overview

Submenu **"Cue"** provides Cue, Loop and Freeze functions.
In this menu, film frame search can be selected and saved.

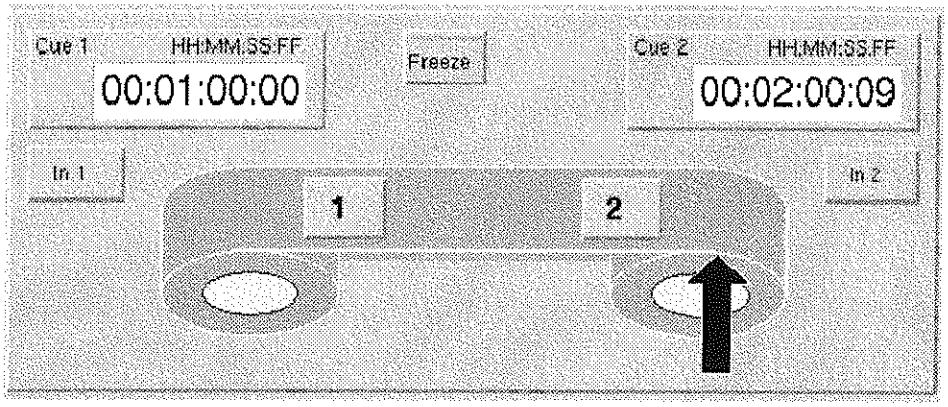
1. Counter Mode window
2. Cue 1 / 2 in setting and Freeze
3. Loop mode buttons

1. Counter Mode Window



Here the user can switch the counter between Timecode, Feet+Frames and Film Frames.

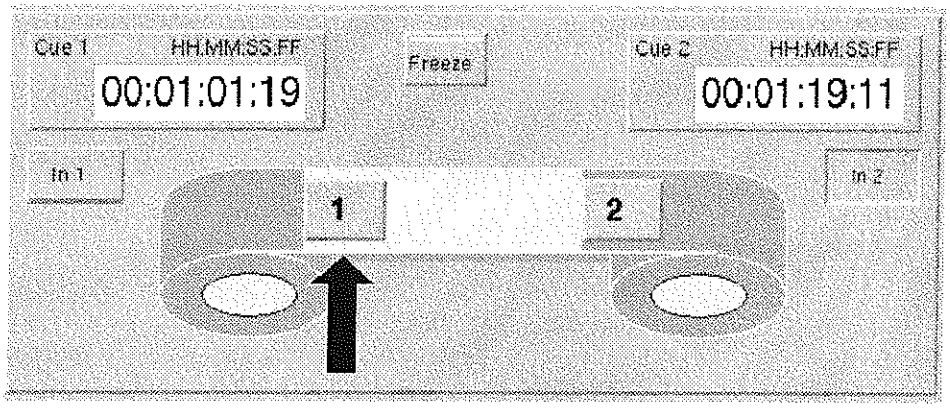
2. Cue1 / 2 settings



Cue moves your material directly to a preselected position.
There are different ways of programming a Cue point. Move the material to the desired position and hit **IN 1.** The corresponding counter position will be entered and displayed above.
Instead of physically playing the material you can also just type it in. Therefore click on the counter display and a numeric keyline will appear on top of the page.
Type in the Cue timecode and confirm by pressing the OK button.

Hitting the function **KEY 1** or **2** cues your material to the programmed position. This is done with shuttle or play depending on the current position of your film material.
Between the cue points 1 and 2, the selected mode applies. From outside or by hitting a function key twice, always Shuttle mode is performed.

Freeze



Freeze mode suppresses every frame between the programmed freeze and defreeze points.
As long as your programmed freeze lasts, the last frame prior the freeze start will be shown.

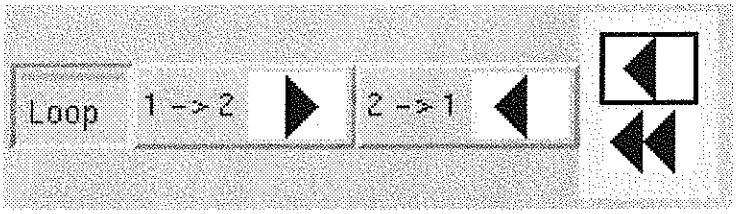
Freeze and defreeze can be programmed as described under Loop mode. Once entered, notice that the bar on the film roll display will be highlighted in yellow.

Hitting the **Freeze** button will execute this function if you play your material in **Forward** mode starting from somewhere before the freeze in-point.

Note that this function is not available in Play Reverse mode.

Note:
Freeze and **Loop** functions are not applicable at the same time.

3. Loop mode



The **Loop** button is a switch to enable or disable the Loop function.
The adjacent buttons are to select Play or Shuttle mode to move the film between the loop start and end points.

The **Loop** function allows you to repeatedly have a look at the same part of the material (e.g. for color matching purposes).

The material is moved from a programmed start to a programmed stop point and back again.

There are different ways of programming a loop.
Move the material to the desired start/end points and press **In 1** / **In 2**.

When pressing **In 1** or **In 2,** the corresponding counter position will be entered and displayed above.

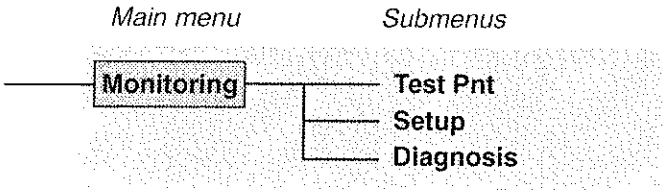
Instead of physically playing the film, you can also program start/end points by typing them in.

Therefore click on the counter display and a numeric keyline will appear on top of the page. Type in the desired values and confirm by pressing the OK button.

Adjacent to the **Loop** button, **Play** or **Shuttle** mode can be selected.

Hitting the **Loop** button will perform your programmed loop until you hit **Loop** again.

4.11 MONITORING MENU



Submenu button **"Test Pnt"**

opens dialog **"Testpoint Selection"**

4.11.1 SUBMENU TEST POINT SELECTION

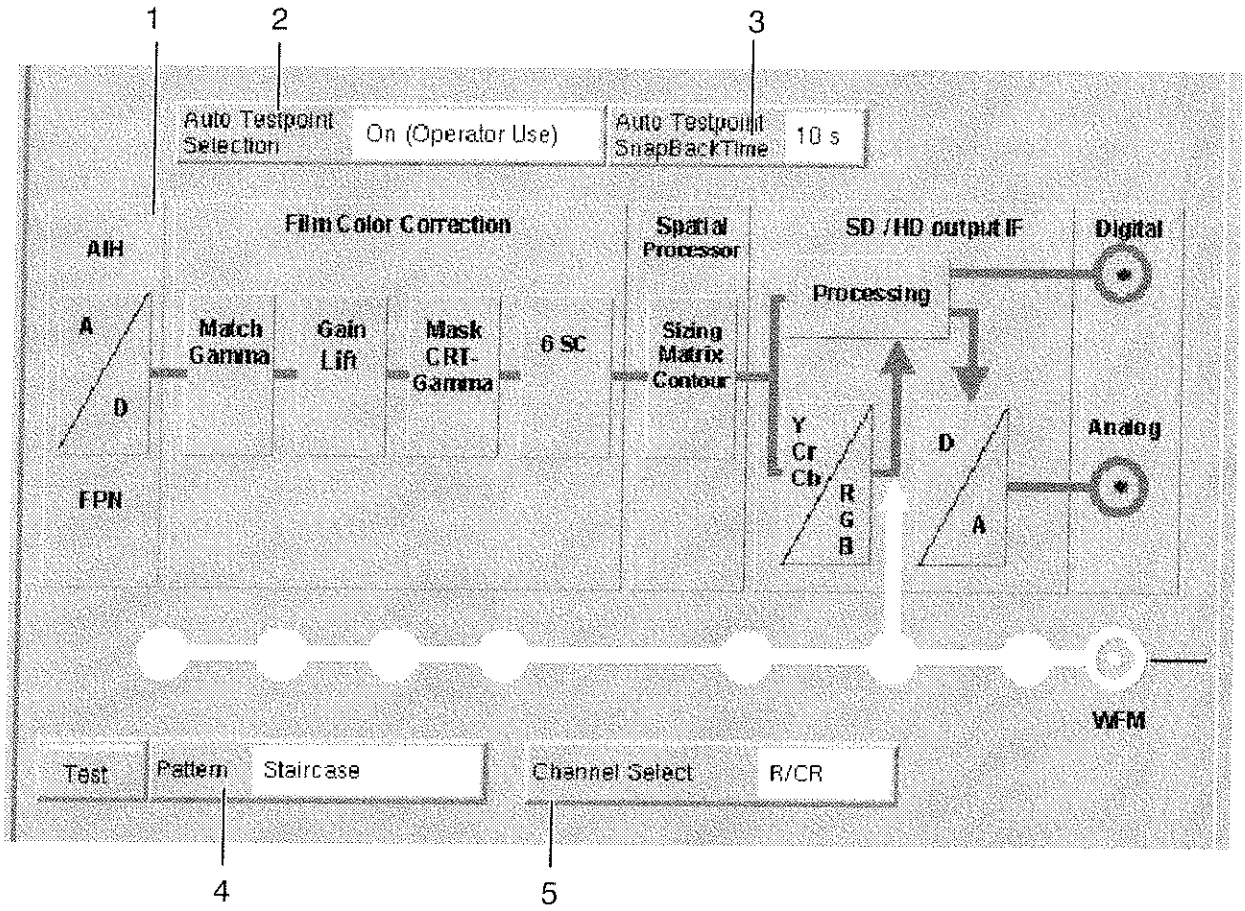


Fig. 458: Main menu **"Testpoint Selection"**

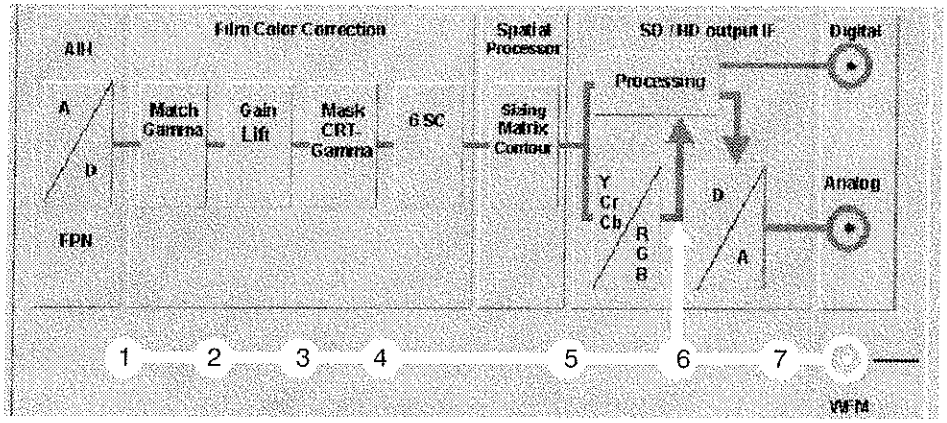
Overview

The menu contains Test Point and Test Pattern selection and serves to select the monitoring video signals for reproduction via different oscilloscopes, vectorscopes and color monitors.

1. Test Point Selection Scheme
2. Auto Test Point Selection
3. Auto Test Point Snap Back Time
4. Test Pattern on / off & Pattern
5. Channel select

Details of Function Buttons, Controls & Displays

1. Test Point Selection Scheme



This scheme roughly shows the path of signal processing in the DataCine

Click on the white points below or inside the scheme to switch the Test Point to the desired position.

The signal you are looking at on a waveform monitor corresponds to what a video signal would look like measured at that point.

This is an emulation, such signals do not exist in reality as there is only data processed inside the machine.

<u>Therefore this function cannot really be used in terms of troubleshooting but is an essential tool for color matching.</u>

A rough guideline where to look at:

Test point 1: Signal source AiH, Illumination Adjustment

Test point 2: Color Negative Matching

Test point 3: Color grading Gain & Lift

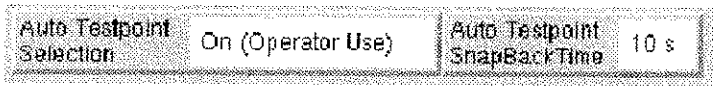
Test point 4: Color Grading Masking 6 CRT Gamma

Test point 5: Spatial processor with sizing, matrix and contour correction

Test point 6: RGB Output Digital

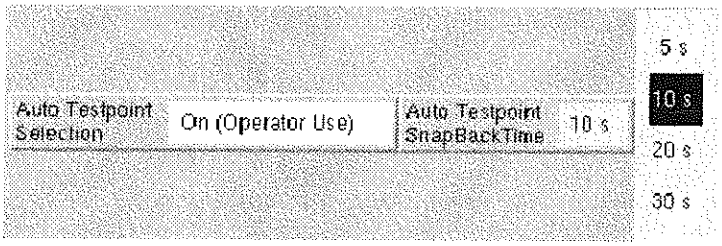
Test Point 7: RGB Output Analog

2. Auto Test Point Selection



This function is very helpful for the colorist (especially if there are not enough waveform monitors on-hand to cover all important test points at the same time).
It automatically swaps over the test point selection according to the control the colorist currently uses.
The function can be switched On and Off.

3. Auto Test Point Snap back Time



Serves to set the current testpoint back to the preselected testpoint.

Snap back time **5s, 10s, 20s, 30s;**

The function is enabled if "Auto Testpoint selection" is on (Operator use).

4. Test & Pattern

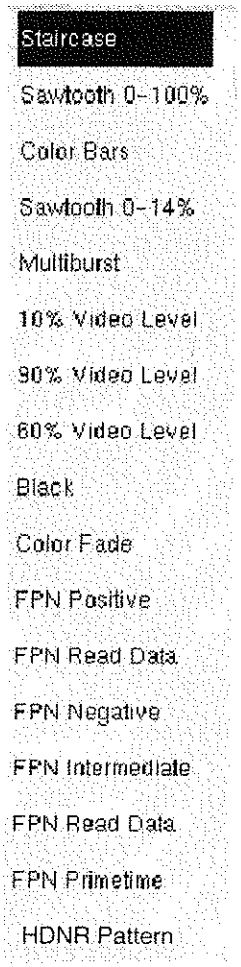
Switches the test pattern (-signal) on or off. The preselection of the test signal (staircase, sawtooth, color bar ...) is made in the dropdown menu "Pattern".

ON: test signal
OFF: film signal

When Test is enabled, the yellow bar on the key is lit.;

This function is redundant in the Home Menu and in the Color Menu.

Pull down menu Pattern



This pulldown menu serves to select the test signals.

Overview

The meanings of the individual test signals are explained below.

"Staircase"
Test signal "staircase"

"Sawtooth_100"
Test signal "sawtooth 0 -100%"

"Colorbar"
Test signal "color bar"

"Sawtooth_14"
Test signal "Ramp 0 -14%"

"Multi-Burst"
Test signal "Multiburst "

"10% Video Level"
Test signal "10% video level, for monitor adjustment" *

"90% Video Level"
Test signal "90% video level, for monitor adjustment" *

* To achieve this video levels, set following parameters:
Color correction - unity; CRT gamma - on; film type - Print pos.;

"60% Video Level"
Test signal "60% video level (area)"

"Black"
Test signal "black"

"Color Fade" 6-Sector Color Correction test signal

"FPN Positive"
Test signal "positive FPN correction signal"

"FPN Data"
Test signal "last stored FPN correction data"

"FPN Negative"
Test signal "negative FPN correction signal"

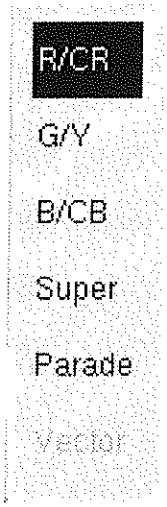
"FPN Itermediate"
Test signal "Intermediate FPN correction signal"

"FPN Read Data"
Test signal "last stored FPN correction data"

"FPN Primetime"
Test signal "Primetime FPN correction signal"

The current selection is shown on the key display. If it reads "HDNR Pattern", a SCREAM Test Pattern is active.

5. Channel select



To switch separate signals/channels in the measuring path of a connected oscilloscope or vectorscope.

Click on the key and make your choice from the drop-down menu.

The following selection can be made: R/C_R, G/Y, B/C_B, SUPER, PARADE and VECTOR.

SUPER stands for "Superimposed", RGB / Y C_R C_B signals are displayed one upon the other.

Operation PARADE mode displays the signals side by side (sequentially).

VECTOR stands for switching over the oscilloscope to vector display mode (only available for coded signals, Y C_R C_B operation).

Submenu button **"Setup"**

opens dialog **"Waveform Monitor Setup"**

4.11.2 SUBMENU SETUP

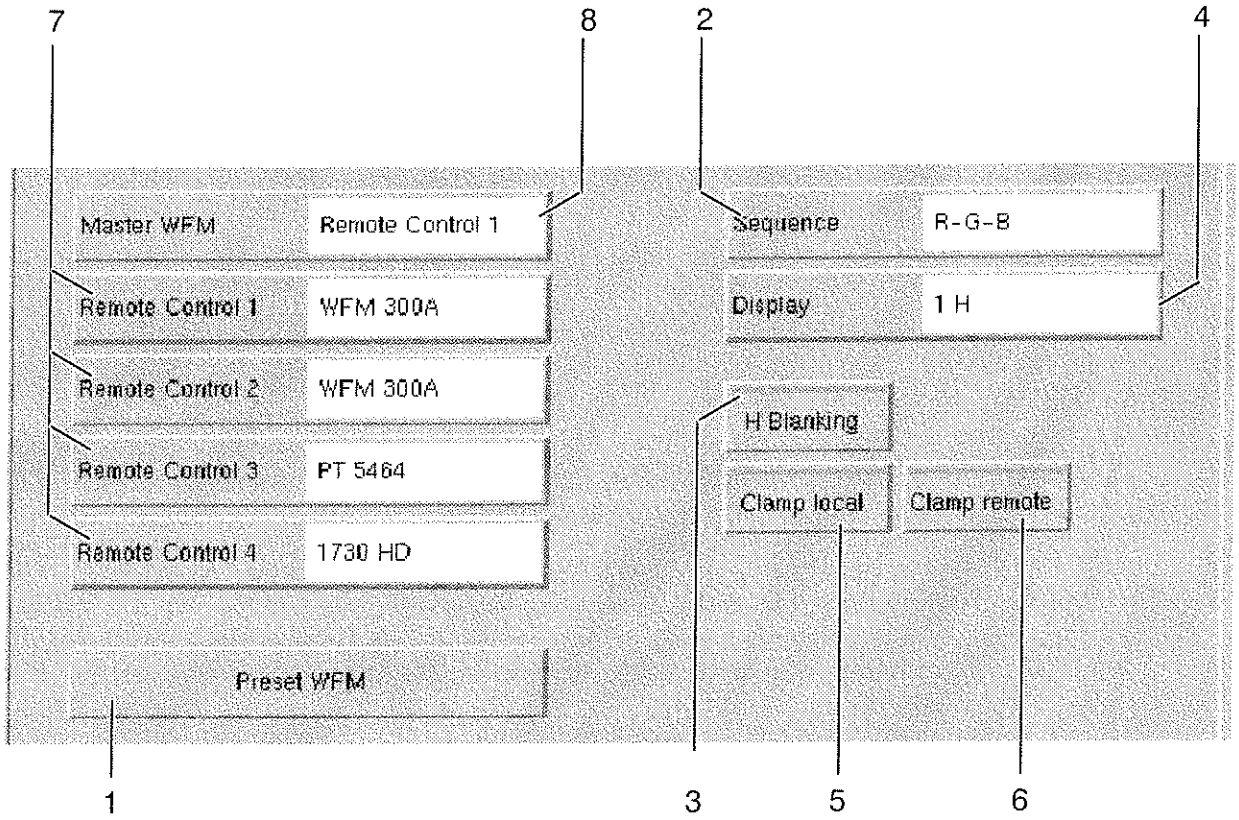


Fig. 459: Submenu **"Setup"**

Overview

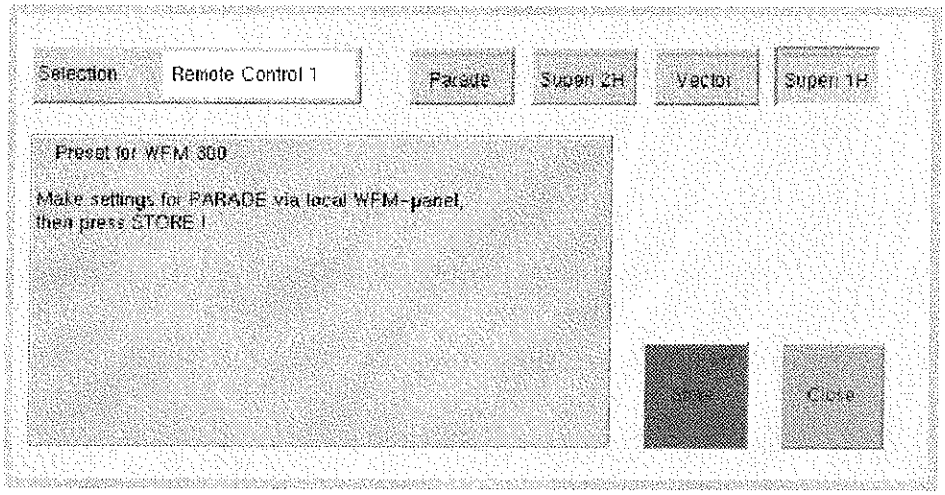
This menu serves to select various wave form monitoring basic settings.

1. Preset Waveform Monitors
2. Sequence settings
3. H-Blanking setup
4. Display mode
5. Clamp Local
6. Clamp Remote
7. Remote Control keys 1-4
8. Master WFM definition

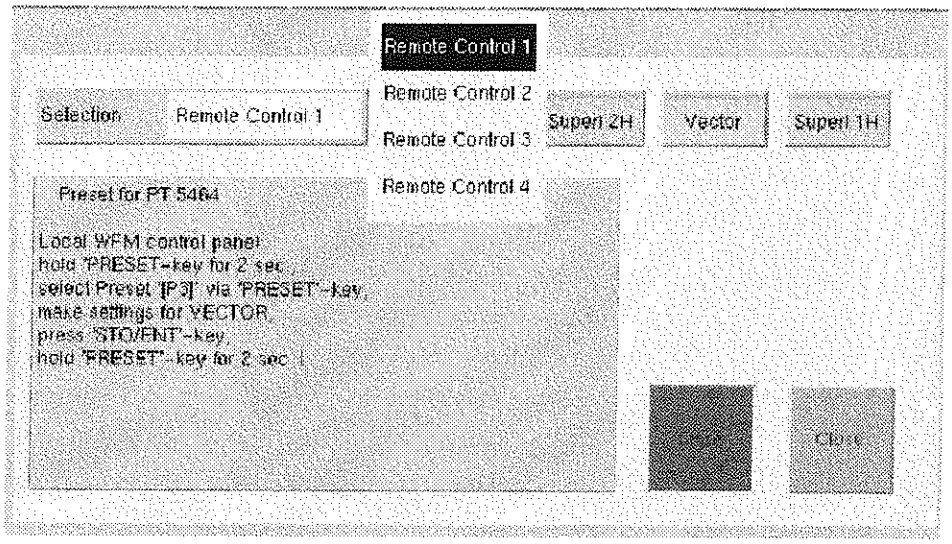
Details of Function Buttons, Controls & Displays

1. Preset WFM

Click on this key to open the waveform monitor preset window.

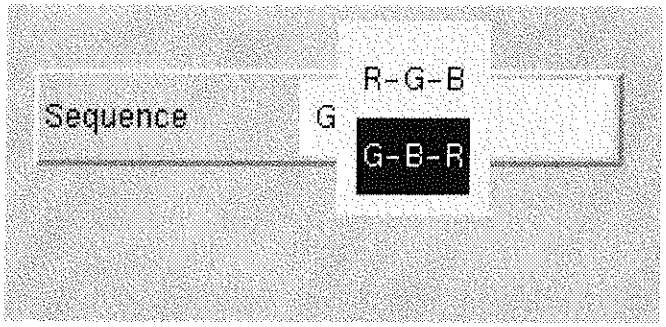


Here you can enter and store the preset settings for your different waveform monitors.
Click on the SELECTION key to chose the (REMOTE CONTROL) interface from the drop-down menu. The type of monitor connected is automatically displayed in the window below.
Now you can choose one of four function buttons to select the display mode of the WFM. When active, the green bar on the button is lit.
At the same time a popup appears in the window below telling you to enter correspondent settings on the local panel of the WFM. Then click the STORE button.
To exit the window, click the Close button.



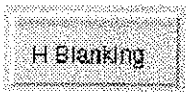
Parade for sequential display of the channels
Superi 1H / 2H for superimposed display of the channels (2 channel lines or 1 channel in sequence each)
Vector for switching over the oscilloscope to vector display (only in YCR CB operation)

2. Sequence Setting



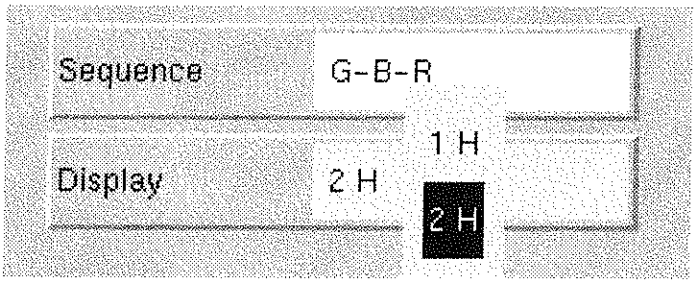
Defines the sequence of the displayed RGB signals.
Click on the key to select one of the possible settings: RGB or GBR.
The standard setting is RGB and normally there is no reason to change it.

3. H-Blanking



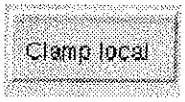
Switches the horizontal blanking of the monitoring signals on or off.
Click on the key to select one of the possible settings.

4. Display Mode



Defines the sequence of the displayed RGB signals.
Click on the key to select one of the possible settings: RGB or GBR.
The standard setting is RGB and normally there is no reason to change it.

5. Clamp Signal Setup



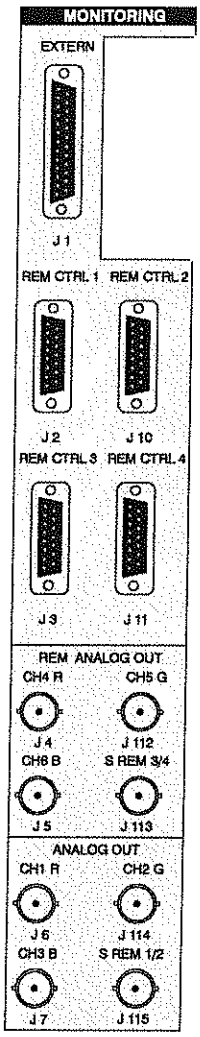
Switches the clamping of the monitoring signals ANALOG OUT RGB (rear of Rack 2) on or off.

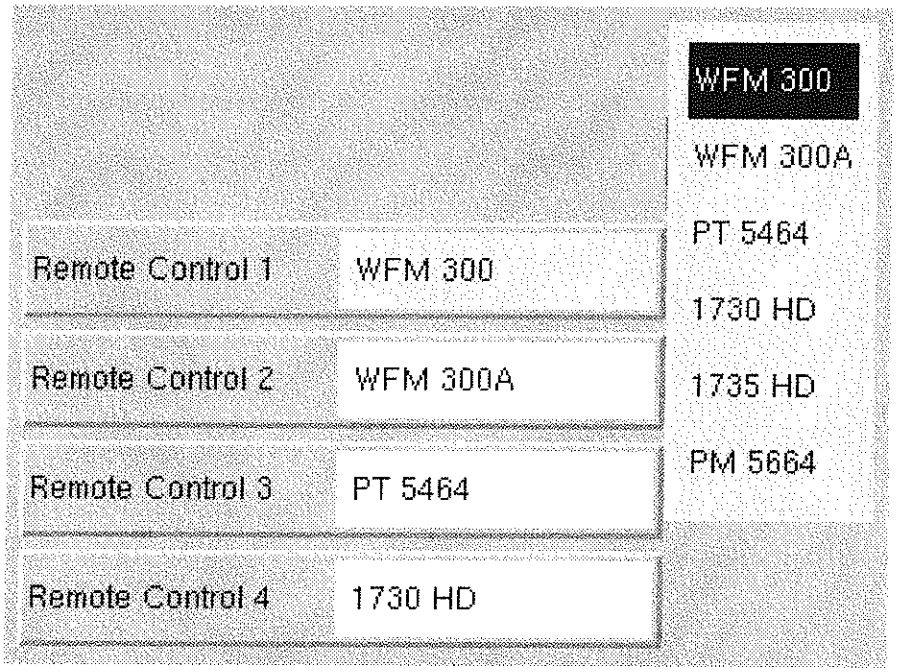
Click on the key to select one of the possible settings.

6. Clamp Remote

Switches the clamping of the monitoring signals REM ANALOG OUT RGB (back of Rack 2) on or off.
Click on the key to select one of the possible settings.

7. Remote Control 1-4





There are 4 waveform monitor interfaces (REM CTRL 1-4) on the terminal panel of Rack 2.

The 4 keys "Remote Control 1-4" serve to assign a certain waveform monitor to the respective MONITORING REMOTE CONTROL interface.

The following waveform monitors are selectable:
WFM 300, WFM 300A, PT 5464, 1730HD, 1735HD (Tektronix), PM 5664 (Philips).

Click on the key and select from the drop-down menu (according to your connected device).

Fig. 454: Connection unit rack 2 (only monitoring part)

Selection: **300** / 300A / 5464 / 1730 / 1735 / 5664

"300" Tektronix WFM 300 / 1740 / 1750 / 1760 connected *

"300A" Tektronix WFM 300 A connected

"5464" Philips PT 5464 HD connected

"1730" Tektronix 1730 HD connected

"1735" Tektronix 1735 HD connected

"5664" Philips PM 5664 (SD) connected **

Important Notes!

* **WFM TEK 1740 - 1760**
Waveform monitor series TEK 1740-1760 has to be configured as WFM 300.

Storing the presets via menu MONITORING F11 preset WFM "Preset for WFM 300" F10 STORE is not supported. Use front control panel for storing presets.

Create a special control cable for WFM series TEK 1740-1760 as follows:

15 pin D-Submin male SDC 2001 Rack 2	25 pin D-Submin male TEK 1740 - 1760	Function
Pin 9	Pin 14	GND
Pin 5	Pin 18	Recall 2 Superimposed
Pin 6	Pin 19	Recall 3 Vector
Pin 7	Pin 17	Recall 1 Parade

** **WFM Philips PM 5664**
Disconnect pin1 and 2 on each side from the control cable PM5664, otherwise the remote control functions are disturbed.

	Table of supported Waveform Monitors								
Manufacturer & Type	**Leader LV5100**	**Leader LV5152**	**Philips PT5464**	**TEK 1735HD**	**TEK 1730HD**	**TEK WFM300A**	**TEK WFM300**	**TEK 1740-1760**	**Philips PM5664**
Store presets from WFM Frontpanel	yes	yes	yes	no	no	yes	no	no	no
Recall presets from WFM Frontpanel	yes	yes	yes	no	no	yes	no	no	yes
Store disabel via WFM Front-panel	yes	t.b.d.	yes	no	no	no	no	no	no
Store from Remote connector	no	t.b.d.	no	yes	yes	no	yes	yes	yes
Recall from Remote connector	yes	t.b.d.	yes	yes	yes	yes	yes	yes	yes
Store disabel Remote connector	no	t.b.d.	no	yes	yes	yes	yes	yes	yes
Vectormode YCrCb	yes	yes	yes	no	no	yes	yes	yes	yes
1line/2lines con-trol via remote	yes	yes	yes	yes	yes	no	no	no	yes
Automatik TV-Standard detec-tion	yes	t.b.d.	yes	no	no	yes	yes	yes	yes
User action nec-essary for changing TV-Standard	no	t.b.d.	no	yes	yes	no	no	no	no
525 Lines supported	yes	no	yes	yes	yes	yes	yes	yes	yes
625 Lines supported	yes	no	yes	yes	yes	yes	yes	yes	yes
1080 Lines supported	yes	yes	yes	yes	yes	no	no	no	no
1125 Lines supported	yes	no	yes	yes	yes	no	no	no	no
1250 Lines supported	no	no	yes	yes	yes	no	no	no	no
720 Lines supported	no	yes	no	no	no	no	no	no	no

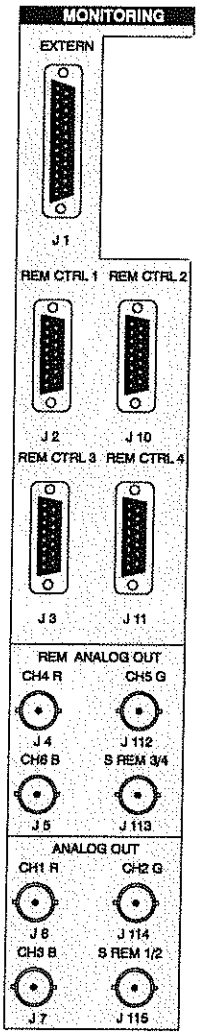
Further WFM Recommendation!

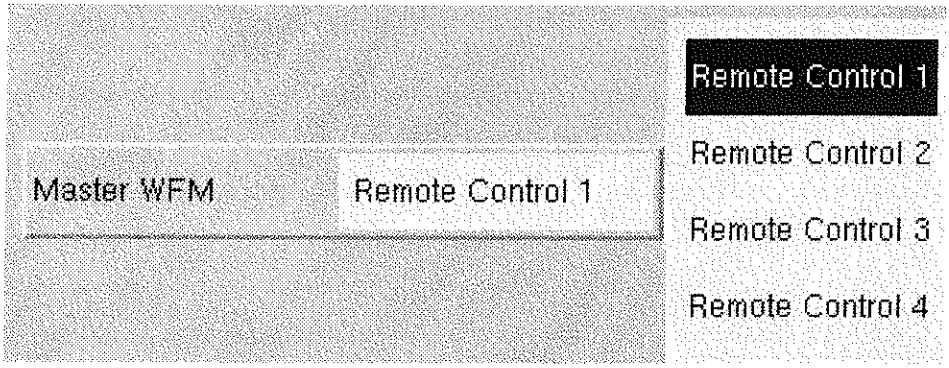
- The scopes type LV 5100 and LV 5152 of the manufacturer "Leader" may be used without remote control from the Spirit DataCine, which normally is not required.
- In addition an HD / SD Scope with SDI inputs connected to an external Secondary Color Corrections is helpful.

- The HD scope WFM700 is useful to check the output of the Spirit DataCine, if connected to the serial HD Link A output.
  An serial HD scope cannot be connected to the test point selection output for monitoring the signal path before.
- The best monitoring solution for both SDTV and HDTV is a HD Scope with analog RGBS inputs connected to the Spirit DataCine Monitoring Outputs at the Terminal Panel Rack 2, see Fig. 454: , page 4-208

.

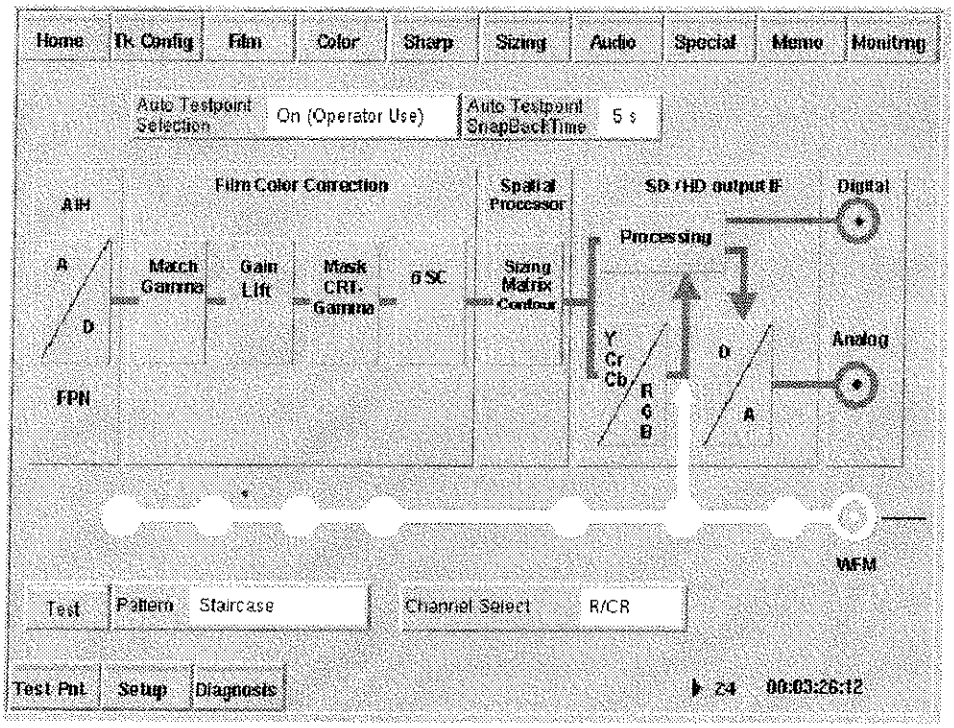
8. Master WFM





Key "Master WFM" defines which waveform monitor is the master WFM.

The master WFM can be operated always from the user interface of the menu Monitoring submenu Test Point



4.11.3 SUBMENU DIAGNOSIS

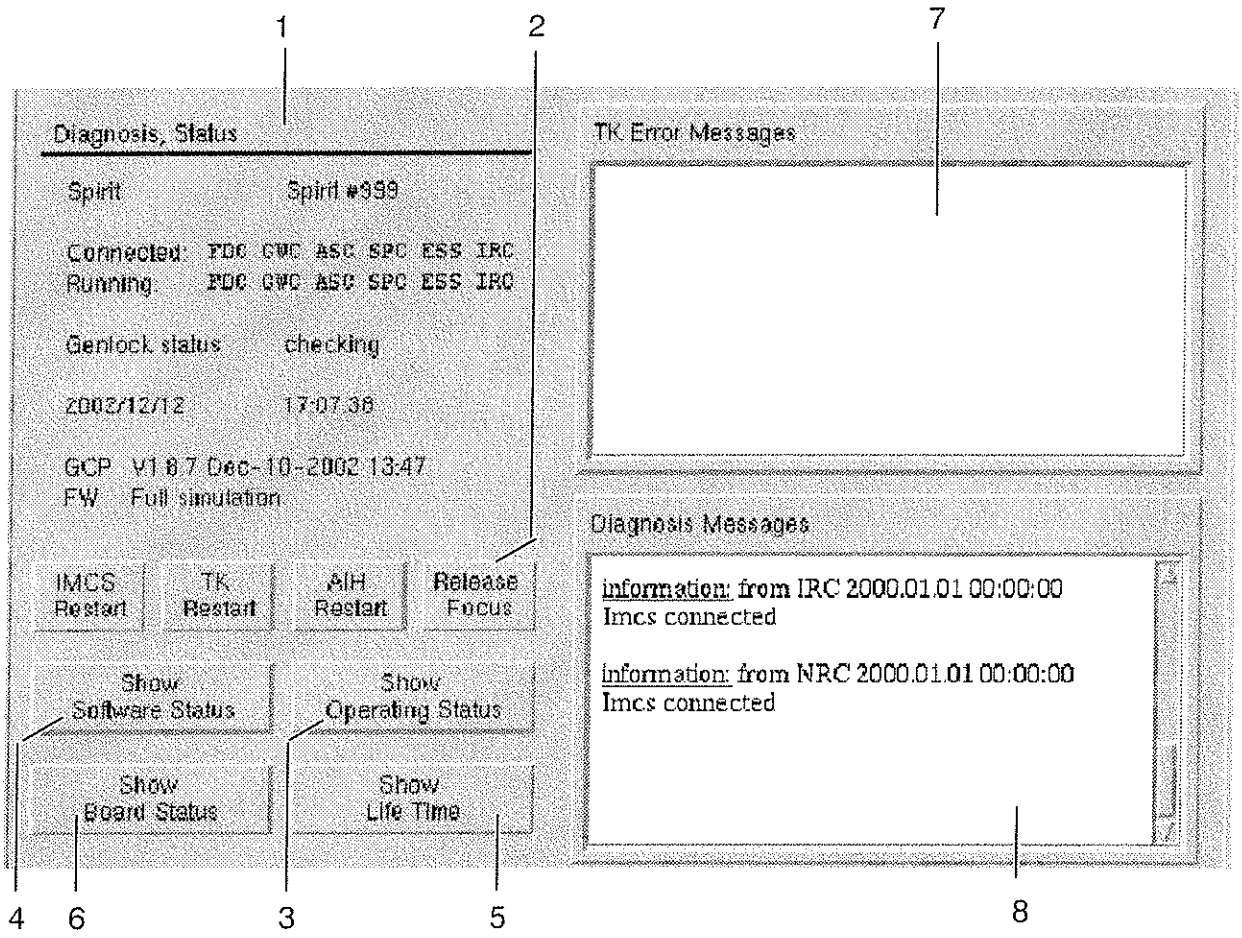


Fig. 460: Submenu **"Setup"**

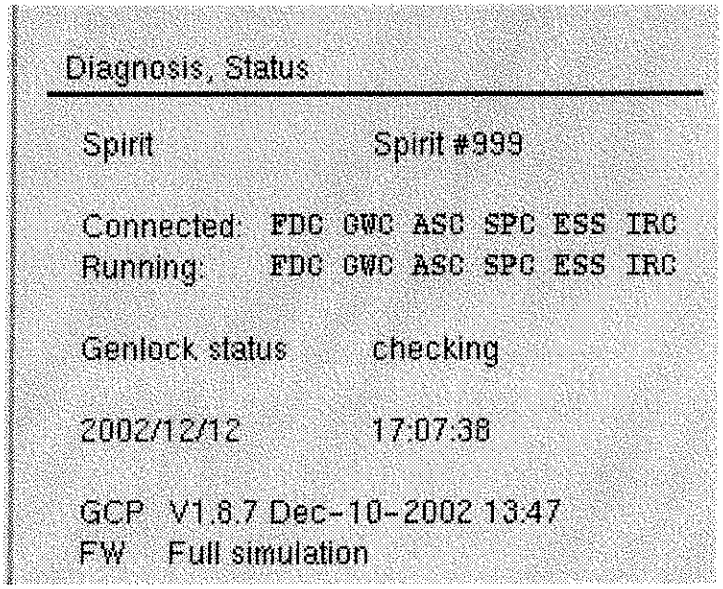
Overview

This menu serves to

1. Diagnosis Status Window
2. Reset Function Keys
3. Operating Status
4. Software Status
5. Life Time
6. Board Status
7. TK Error Messages Window
8. Diagnosis Messages Window

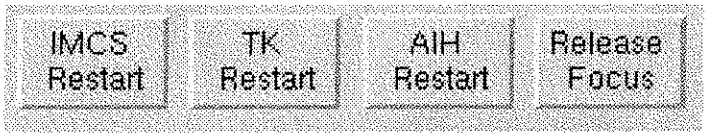
Details of Function Buttons, Controls & Displays

1. Diagnosis Status Window



This window contains various system information such as:DataCine/Telecine serial number, the connected machine control units and their status, genlock status;date, time and the software and firmware versions of this panel (GCP).

2. Reset Function Keys



The **Spirit** DataCine is provided with 4 reset buttons:

IMCS RESTART: restarts the IMCS communication between the GCP and the DataCine.

TK RESTART: performs a software restart of all machine control units of the DataCine.

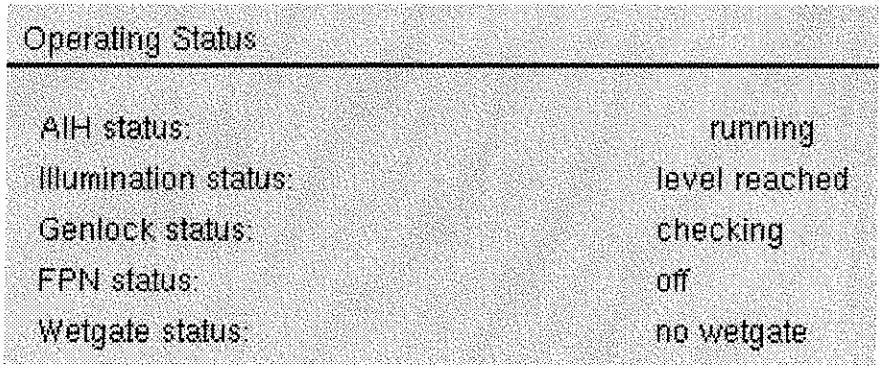
AIH RESTART: performs a software restart of the Analog Imaging Head (the scanner unit of the Spirit DataCine).

RELEASE FOCUS: gets the AIH scanner block in the upmost position. This is an emergency recovery function. E.g. in case there was a filter in the focus path, the focus initialization process is disturbed and the AIH is blocked on his way down (without having reached the downmost position, AIH is not able to move up again).

3. Operating Status

Show Operating Status

Click on this key to open the operating status window.



The operating status of certain parts of the DataCine/Telecine is displayed.
Example:

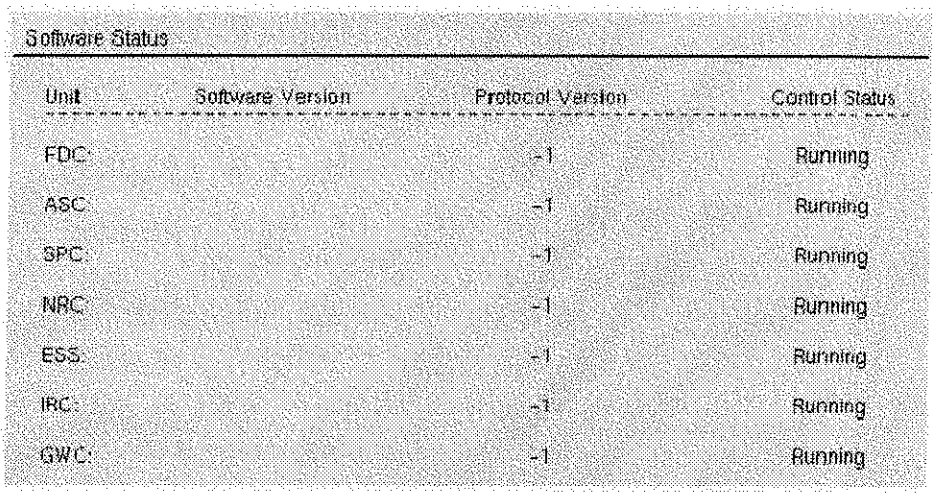
AIH STATUS:	running
ILLUMINATION STATUS:	shutter closed
GENLOCK STATUS:	internal sync ok
FPN STATUS:	off
WETGATE STATUS:	no wetgate

To exit the window, press the Close button.

4. Software Status

Show Software Status

Click on this key to open the Software status window.



Here you can check the software versions of the machine control units (processors).
Version numbers, date, protocol and control status information are displayed.

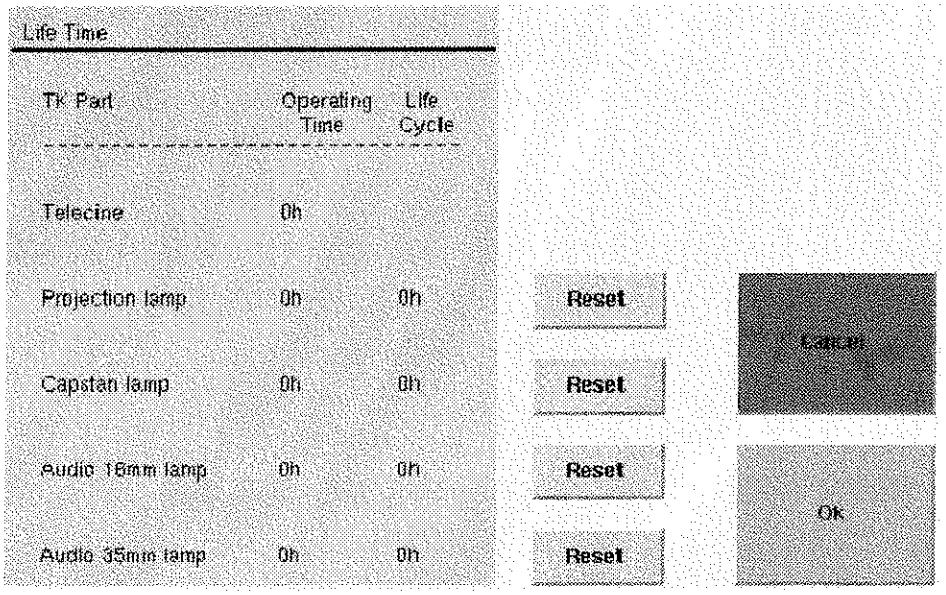
E.g.:

FDC: V. 4.60 Dec-7-2002 14:10 5 Running

To exit the window, press the Close button.

5. Life Time

Click on this key to open the operating status window.

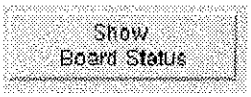


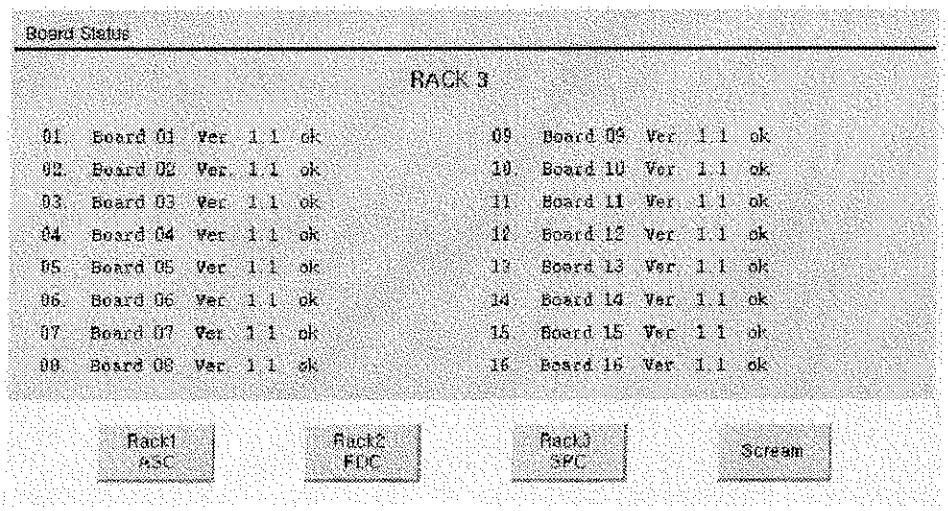
Here you can check the operation hours ("Life Time") of certain parts in your DataCine and you can see after how many hours (Life Cycle") they should be replaced.The following units figure:
DataCine (in total), Projection lamp, Capstan lamp, Audio 16 lamp (optional), Audio 35 lamp (optional).

In case a unit is replaced, the LIFE TIME display can be reset by pressing the corresponding RESET button.
To exit the window, press the Close button.

6. Board Status

Click on this key to open the Board status window.




Board Status
RACK 3
01. Board 01 Ver 1.1 ok
02. Board 02 Ver 1.1 ok
03. Board 03 Ver 1.1 ok
04. Board 04 Ver 1.1 ok
05. Board 05 Ver 1.1 ok
06. Board 06 Ver 1.1 ok
07. Board 07 Ver 1.1 ok
08. Board 08 Ver 1.1 ok
09. Board 09 Ver 1.1 ok
10. Board 10 Ver 1.1 ok
11. Board 11 Ver 1.1 ok
12. Board 12 Ver 1.1 ok
13. Board 13 Ver 1.1 ok
14. Board 14 Ver 1.1 ok
15. Board 15 Ver 1.1 ok
16. Board 16 Ver 1.1 ok
Rack1 ASC
Rack2 FDC
Rack3 SPC
Screen

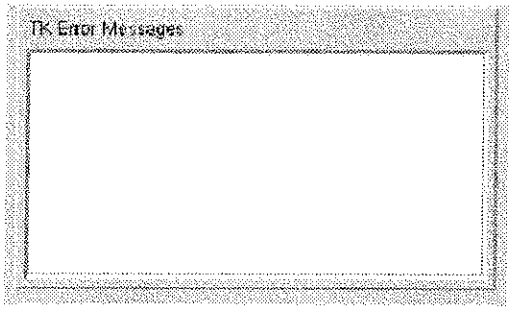
Here you can check which boards are mounted in Rack 1, Rack 2 and Rack 3 of your DataCine.

If existing, they figure with slot number, identification letters and number, software and firmware versions.

To exit the window, press the Close button.

7. TK Error Messages Window

Error messages sent from the DataCine/Telecine are displayed in this window.



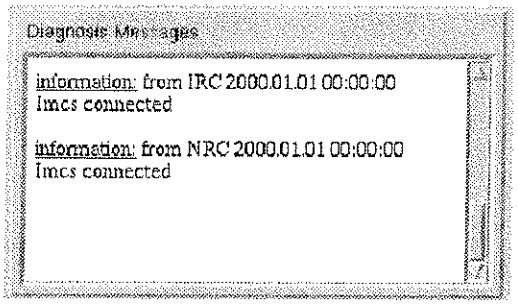
Example for a typical message:

"Standard error from FDC 2001.5.17.../remote select rejected, door is open".
It is possible to scroll through the messages by dialing the adjacent digipot.

To delete all error messages, hold down the UNITY button and click to the Error Messages Window.

8. Diagnosis Messages Window

Error messages from the GCP panel itself, e.g. provoked by wrong handling, are displayed in this window.
Not yet implemented.



5. OPERATION

Front doors opened
Film operation up to a fixed speed of maximum 50 frames per second is possible.

Front doors closed
All operation modes are possible.

Attention:
Opening the front doors effects that a high shuttle speed is reduced to 2 times play speed!

Front doors locked:
With a certain shuttle speed (>2 times play) closed front doors are locked additionally. The front doors are unlocked as soon as the shuttle speed is reached again.

5.1. REPRODUCTION (PLAY)

There are four reproduction modes - Play, Jogging, Vario Motion and Shuttle. The following sections will give an overview of their features and applications.

5.1.1. PLAY

Play mode for film image reproduction at normal speed.

Reproduction in this mode is started by pressing key "Play ▶" on the control panel.

5.1.2. JOGGING

Select Jogging mode if you want to view a scene in slow motion frame by frame.

Reproduction in this mode is started by pressing key "Jog" on the control panel.

In this mode the trackball can be used as Jog speed control.

5.1.3. VARIO MOTION

Select Vario Motion mode if you want to play back a scene in slow motion.

The film speed can be set with the trackball in the range of the SAS speed in forward and reverse direction.

Vario Motion mode is started by pressing key "Var" on the control panel.

5.1.4. SHUTTLE

Select Shuttle mode if you want to reach a distant film position within shortest time (also rewind).

The film speed is set with the trackball in the range of +/-10 times the normal speed (with 35mm).

Reproduction in this mode is started by pressing key "Shtl".

Note!

The maximum film speed is reduced near the end of the film.

In "Shtl" mode, the video picture can serve for orientation purposes.

5.2. AUTOMATIC SWITCHING-OFF

The film scanner includes three automatic switching-off functions.

1. Film end switching-off
2. Film break switching-off
3. Thermal switching-off

5.2.1. FILM END SWITCHING-OFF

In the **Play** ▷ or **Play** ◁ mode, the film is spooled out completely and the film drive is stopped automatically when the end of film is reached.

In the **Shtl** ▷ or **Shtl** ◁ mode, the film speed is reduced from maximum to normal speed and then stopped when the end of film is reached.
Pressing the Shtl key once more spools the film out completely and the film drive is stopped automatically.

The end-of-film switching-off function is enabled again by pressing the **Stop** key on the film deck panel.

5.2.2. FILM BREAK SWITCHING-OFF

In the **Play** ▷ , **Play** ◁ and **Shtl** ▷ or **Shtl** ◁ modes, the film drive is stopped immediately in case of a film break.
After a short time, the pilot light of the Standby key on the Local Control Panel goes out and the **Stop** key lamp on the control panel flashes.
The FPN correction is preserved, the last picture is not frozen.

5.2.3. Thermal switching off

To avoid overheating problems caused by to high a temperature of outgoing cooling air, a thermal switch is installed into the SDC 2002.

The mains voltage will be switched off by means of this sensor when the exhaust air exceeds a temperature of 55°C ± 4°C (131°F ± 39°F).

Thomson guarantees SDC 2002 operation at an ambient temperature of maximum 35°C (95°F). The temperature of the exhaust air is normally by 10°C (50°F) higher than the intake air. If the ambient temperature rises up to 40°C (104°F) and higher, damage to a running SDC 2002 is possible.

In such a case the machine is disconnected from the mains and further operation is only possible after the ambient temperature was reduced.

The thermal switch is performed with a hold function and the mains voltage can only be switched on via a reset button of this switch (see figure 501:).

In case the SDC2001 cannot be repowered:

- Set the power switch in position "**off**"
- Open the rear doors
- Check the power connection to the SDC 2002:
  - Mains voltages at the Mains Terminal Board FH 1031 (FH 1033)
  - 3 (2) phase circuit breaker
- Push the reset button of the internal SDC 2002 thermal switch (figure 501:).

- Close the rear doors
- Switch on the machine

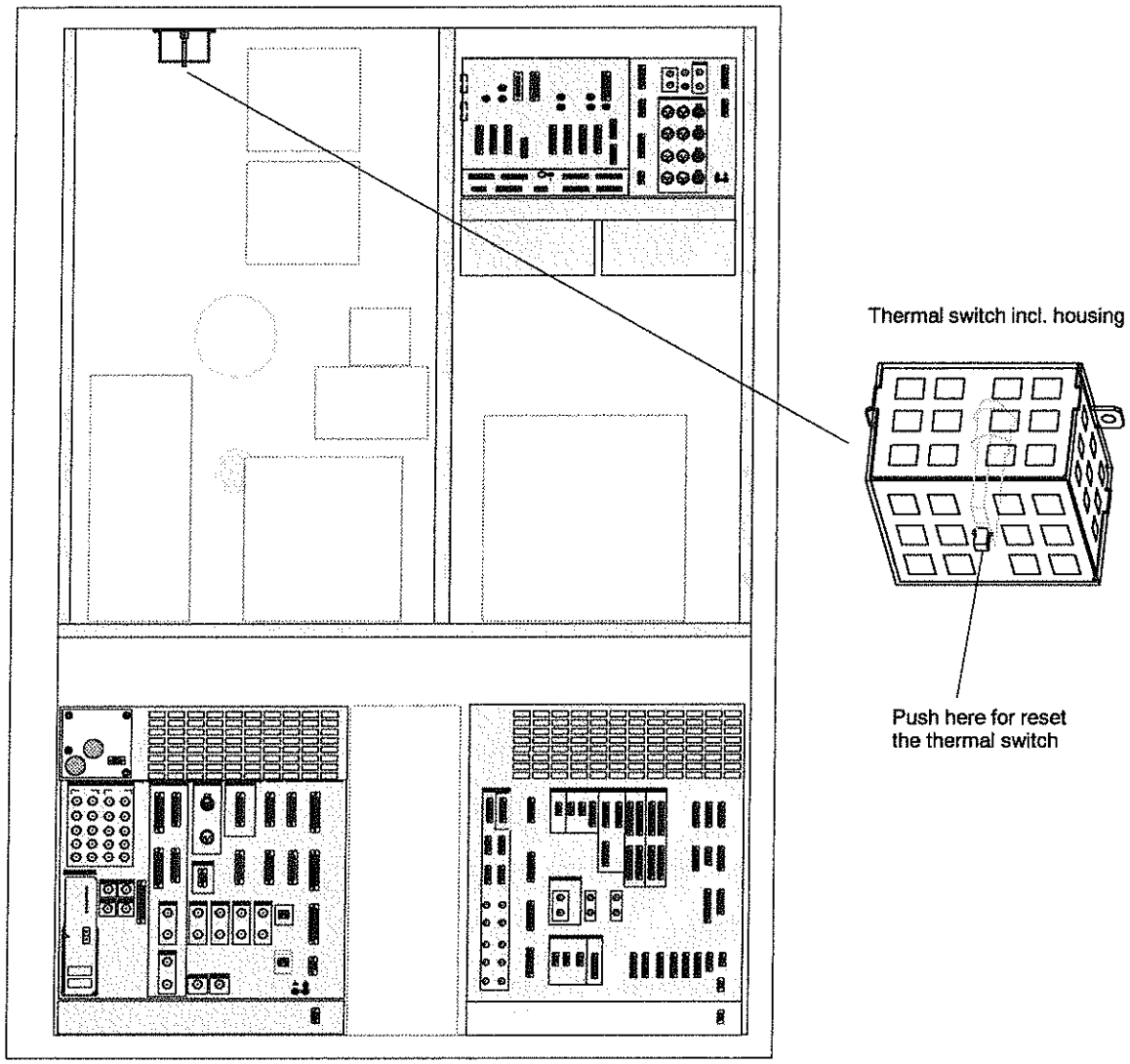


Fig. 501: : SDC 2002 with thermal switch

5.3. Manual emergency switching-off

In an **emergency** case, the film scanner can be switched off **immediately** with the **Power** switch (on the right upper side of the film scanner cabinet) from all operation modes without any risk for the film scanner or the film.

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

Technical Information

TI-S-2001-002

Date: November 20, 2001 **Product:** SDC 2000/2001
Responsible: Hannfried Preissler

Sheet: 1/21

Reference: -
Department: PJM
Phone: +49 (0) 6155 870 289
Fax: +49 (0) 6155 870 428
e-mail: PreisslerH@thmulti.com

Note: Please forward this Technical Information to our customers!
All orders only available via customer support organization!
Please add this Technical Information in your Customer's Manual.

SPIRIT DataCine SDC 2000 / SDC 2001

Xenon Lamp Illumination
Operation, Maintenance & Exchange

The target of this technical information is to optimize the illumination path and to achieve maximum lifetime from the Xenon projection lamp used in the Spirit DataCine SDC 2000 / 2001.

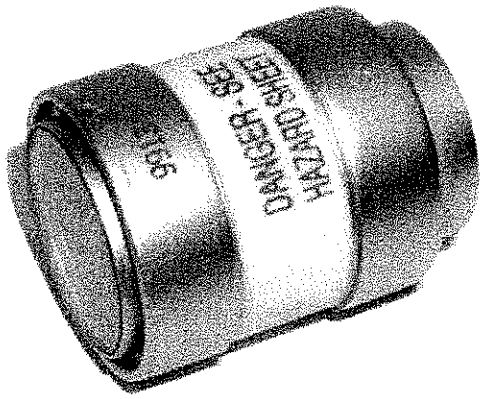


Figure 1: Xenon Projection Lamp Y1711

Please follow the rules and instructions listed below, which provide detailed technical information concerning maintenance guidelines for the illumination path, the setting of the Spirit DataCine SDC 2000 / 2001 and the Xenon arc lamp!

Note!
Xenon Lamp Y1711 replaces the former lamp type LX 300F. Handling and specifications of both lamp types are identical.

Contents

1. The Arc Xenon Lamp 3
1.1. Warranty 3
1.2. Typical Characteristics of the Xenon Lamp 3
1.3. Typical Lifetime 4
1.4. Lifetime and Operating Parameters 4
1.5. Optimum Lamp Current 5
2. Operation Recommendations 6
2.1. Display of the Lamp Current 6
2.2. Setting of 6 dB Gain 7
2.3. The Lamp Ignition 8
2.4. Gate Blast Unit 8
2.5. External Gate Blast Compressor Requirements 8
3. Possible Reasons for shortened Lifetime of the Xenon Lamp 9
3.1. Lamp Current constant higher than 22 Amps 9
3.2. Lamp flickers or Lamp does not ignite 9
3.3. Shading Problems 9
4. Exchange of the Xenon Lamp 10
4.1. Safety Instructions! 10
4.2. Insertion of a Xenon Lamp: 11
4.3. The right Amount of Thermal Conductive Compound 11
4.4. Read out and Reset Life Time of Projection Lamp 13
5. Maintenance of the Light Path 15
5.1. Cleaning the Integration Cylinder 15
5.2. Check the external Gate Blast Compressor 16
5.3. Check the Spirit DataCine Gate blast Unit 16
5.4. Change the Filter Mats of AIH & Rack 2 17
6. Disposal of used Lamps 19
7. Spare Parts 19
8. Handling of Warranty Claims 20

Appendix Return Sheet

1. The Arc Xenon Lamp

The Spirit DataCine SDC 2000 / 2001 was designed around very tightly controlled spectral characteristics and the optical performance is guaranteed only with the use of the Xenon arc lamp Y1711. Detailed order information is in section "7. Spare Parts".

Note! Please use only this lamp type!

1.1. Warranty

Use the "Return Sheet" from chapter 8!

Lamp warranty is 500 hours and all claims should be filed through the sales organization from which you purchased your replacement bulbs. This warranty only applies to lamps purchased through Thomson Multimedia or one of its authorized agents.
The 500 hours warranty applies only, if the lamp is operated at a current of 18 to 22 Amps.

For the handling of justified warranty claims to Thomson Multimedia, see the instructions of chapter 8.

1.2. Typical Characteristics of the Xenon Lamp

The light output of a **new** Y 1711 lamp can vary between lamps. The variation is in the range of +/- 15% of the nominal value, see Figure 2.

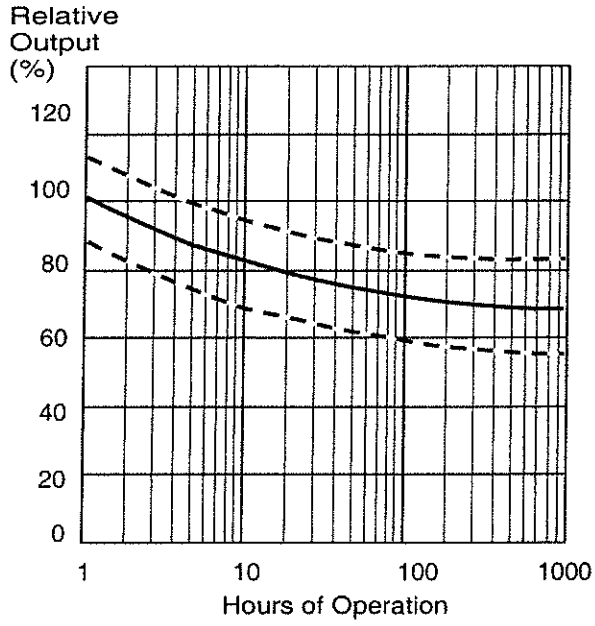


Figure 2: Output vs. time

Due to blackening of the lamp's cover glass, caused by erosion of the electrodes within the lamp, the light output will decrease as the lamp ages according to the curve shown in Figure 2.

As a result of this blackening and other aging effects, the light output after 100 hours of operation will decrease to about 70% of the initial light output.

After 500 hours of operation the light output intensity will be relatively constant throughout the life of the lamp. Failure of the lamp typically occurs when it cannot longer be ignited.

The next chapter describes different factors, which influence the lifetime of the lamp and recommended practices that could help to increase the lifetime of the lamp.

1.3. Typical Lifetime

The lifetime of the Xenon lamps depends on operation and handling. The typical lifetime is about 1000 hours for the Y 1711 lamp. The end of life can be defined as 50% of the initial light output, or when the lamp fails to ignite.

1.4. Lifetime and Operating Parameters

The lifetime of the Xenon lamps depends on several operating parameters:

The operating current of the lamp should be maintained around its nominal current value so that the maximum lifetime can be reached.

Operation with higher current levels will result in more light output, but will overload the lamp electrodes. This will cause excessive "burn-back" on the cathode, which will in turn increase the length and resistance of the electrical arc.

Prolonged operation in this way will result in a reduced lifetime of the lamp. If the current is less than the nominal current, the arc will partly over-heat the cathode, also shortening lamp life.

The low current level detailed in the lamp specifications only indicates the lowest current where the arc will still operate and does not indicate the correct operating current level.

An optimum lamp lifetime is obtained if the lamp is used and operated with the nominal current (18 Amps) as it is shown in the Figure 3.

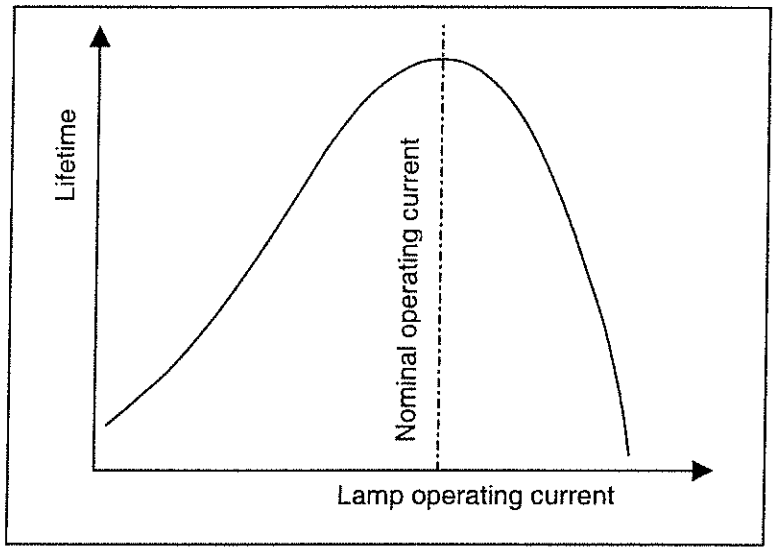


Figure 3: Lifetime as a function of operating current

1.5. Optimum Lamp Current

The optimum operating current of the lamp is in the range between 18A and 20A.

A higher lamp current will produce more light, but will decrease the lifetime.

The optimum operating current may not provide enough illumination to scan film with a higher average density.

In this case lamp currents higher than 20A can be used. A current higher than 22A will decrease the lifetime significantly.

It is recommended to switch the analog gain to +6dB and turn down the light to avoid this decrease of lifetime.

If your average lamp current especially at Color Negative film is higher than 22A, please check the illumination path (e.g. change the lamp, clean the lenses, check the integration cylinder of the gate block).

In the normal operating mode the current control of the lamp power supply is switched to automatic.

In this mode the lamp current will not drop below 17.8A. If less light level is required, this is controlled by the mechanical fast aperture plate in the Spirit DataCine.

2. Operation Recommendations

2.1. Display of the Lamp Current

The lamp current is displayed on the control panels with software-version V3.32 and higher. Check if the current of the lamp is in the range between ≈18 and 20 Amps.

Functional Control Panel

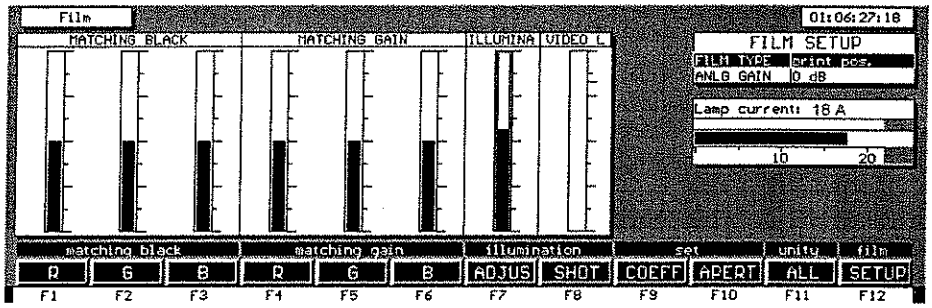


Figure 4: FCP Film setup with display of the lamp current

Graphical Control Panel

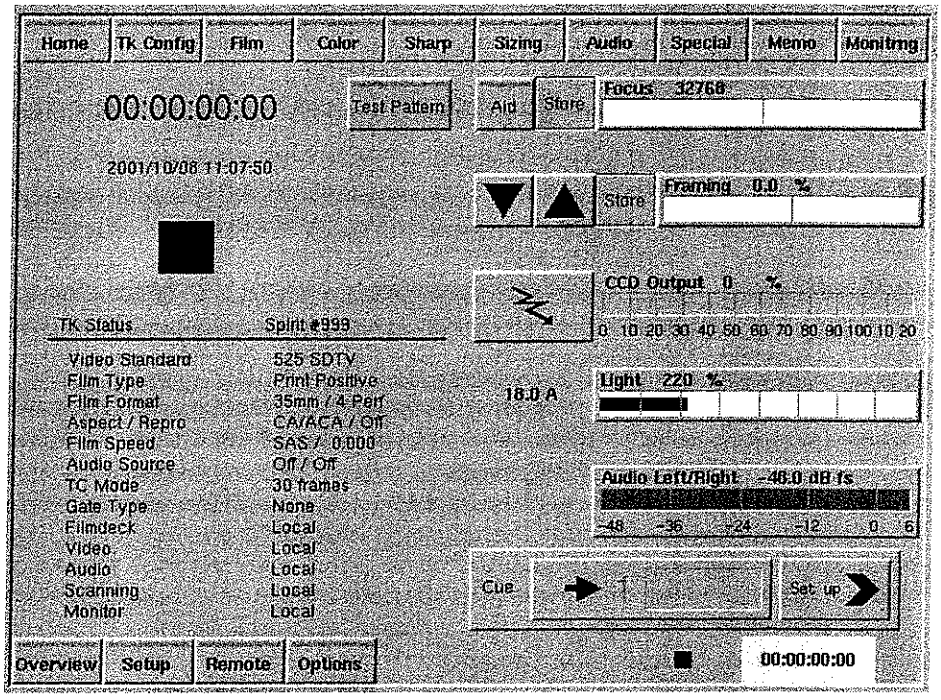


Figure 5: GCP Home menu with display of the lamp current

2.2. Setting of 6 dB Gain

The analog gain increase of 6 dB can be used to decrease the lamp current. This will be accompanied by a slight decrease in the video signal to noise ratio at the Spirit DataCine film scanner output.

Setting of 6 dB Gain via Functional Control Panel

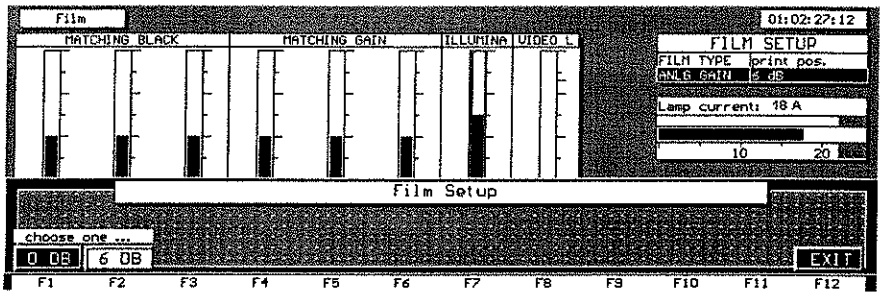


Figure 6: FCP Film Setup with selection of 0dB or 6dB gain

Setting of 6 dB Gain via Graphical Control Panel

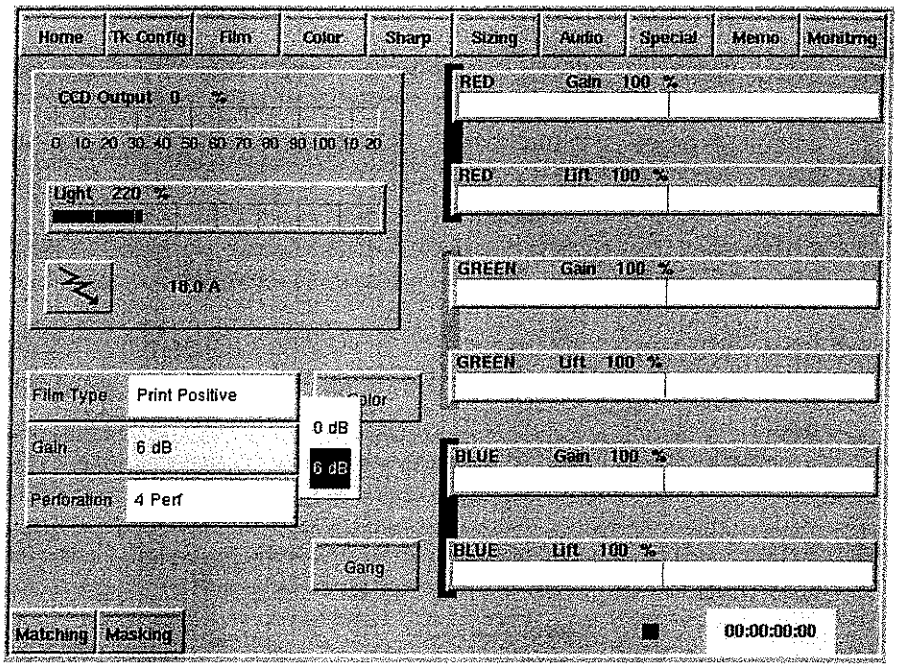


Figure 7: GCP Film menu with selection of 0 dB or 6 dB gain

2.3. The Lamp Ignition

The igniter of the Xenon arc lamp has the function to break down the air gap between the electrodes of the bulb.

First step is the boost current phase, which lasts for about 250 milliseconds. A high boost current will flow to start the arc in the bulb.

The second step is the running phase. A nominal current will flow between the electrodes maintaining the arc and thus the illumination of the lamp.

The boost current is normally 2 – 3 times the nominal working current. Studies found that each ignition decreases the expected bulb life by about thirty minutes.

Therefore it is recommended to avoid turning the SDC 2000/2001 on/off frequently.

2.4. Gate Blast Unit

THOMSON multimedia recommends feeding compressed air to the gate blast unit to keep the integration cylinder dust free!

The integrated gate blast unit consists of a pressure reducer, an air filter and a magnetic valve, which keeps the integration cylinder of the film gate free from dust.

An external air compressor and a high-pressure hose are needed additionally.

2.5. External Gate Blast Compressor Requirements

The external compressor should have the following specifications:

- 3 - 7,5 bar = 40 - 100 lb. / sq. inch
- Air pre-filter (max. 40μm particle size)
- Oil free air path
- Less than 80 % relative air humidity
- Required air flow 40 l/min per Spirit DataCine film scanner

For installation instructions refer to chapter 4.2.8 in the "Planning and Installation Manual" and chapter 6.8.1 in the Operating Manual of the Spirit DataCine SDC 2000 / 2001.

3. Possible Reasons for shortened Lifetime of the Xenon Lamp

Before complaining about the Xenon lamp, it is highly recommended to check the lamp current, the cleanness of the optical light path and the function of the lamp house (igniter) as described below.

3.1. Lamp Current constant higher than 22 Amps

If the lamp current with the Kodak TAF film (part of the Telecine Tool Kit) and the following film scanner setup

- **global unity**
- **gain 6dB = off**
- **peak white set with illumination control to 100% on the waveform monitor at test point "FPN"**

is higher than 22 Amps (even with a newer lamp) please check as follows:

1. Film gate (Slit and the exit port of fiber optic).
   Clean it according to chapter 5.
2. Illumination cylinder coating of the film gate.
   The coating should be clear white.
   If the coating is gray or yellowish, the gate block needs to be exchanged.
3. Dirt in the optical light path.
   Clean the optical path according to the instructions of chapter 5.
4. Too much thermal compound is used between lamp and heat sink after a lamp exchange.

3.2. Lamp flickers or Lamp does not ignite

1. Check the correct lamp position in the heat sink and in the lamp house, see Figure 8.
2. Check both lamp power connectors at the heat sink, see Figure 8.
3. Check the igniter by exchanging the lamp house FH 1921.
   Spare part order number, see chapter 7.

3.3. Shading Problems

1. Check the correct lamp position in the heat sink and in the lamp house, see Figure 8.

4. Exchange of the Xenon Lamp

4.1. Safety Instructions!

Safety Hazards Concerning the Xenon Lamp!

1. EXPLOSION
   High internal pressure in the Xenon lamp can cause explosive failure resulting in serious bodily injury.
2. HIGH VOLTAGE
   Ignition voltage of the Xenon lamp is high and can be deadly.
3. UV RADIATION
   Ultraviolet radiation generated by the Xenon lamp can cause burns and eye damage.
4. HOT SURFACE
   Portions of the Xenon lamp can reach temperatures of several hundred degrees centigrade and cause serious burns if touched.

Safety Instructions!

1. Switch off the film scanner before doing any cleaning or maintenance.

   To do this, open the rear doors and disconnect the film scanner from the mains by switching off the circuit breaker at the Power Terminal Unit.
2. Prior to cleaning the drive mechanism, optical block, capstan roller or audio scanners, make sure that no film is threaded.
3. Keep the xenon lamp housing closed for 30 minutes to ensure the lamp cools down before starting work on the lamp (burn hazard).

Careful and correct exchange of the lamp on its heat sink is mandatory for safe operation and for optimum life of the lamp.

See also chapter 6.5 of the Operation Instructions SDC2000/2001 "Change of the projection lamp".

- Wear protective gloves and face shield during the exchange!
- Reconnect the cables and close the lamp house lid!

4.2. Insertion of a Xenon Lamp:

- Insert the heat sink with the lamp in the correct position, as shown in Figure 8.

Caution! **The guide pins of the heat sink must sit in the v-slot as shown below. If the projection lamp is not inserted in the right position as shown in Figure 8, useful light intensity will be 10 - 20% less than normal!**

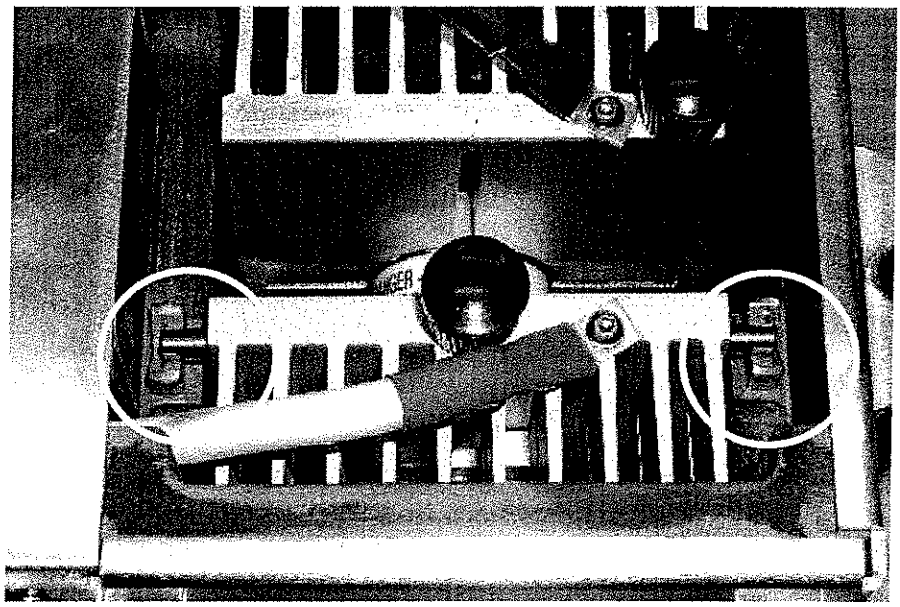


Figure 8: Correctly inserted lamp

4.3. The right Amount of Thermal Conductive Compound

The compound has a thermal and electrical resistance which is higher than metal but lower than air. If the compound is applied too heavily, the heat will not transfer properly to the heat sink. In addition, due to the current flow in the compound, which has electrical resistance, heat will be produced in the compound. An overheating of the lamp could result. This will shorten the lamp lifetime!

Note! **Please be certain that a metal-to-metal contact is made between lamp and heat sink!**

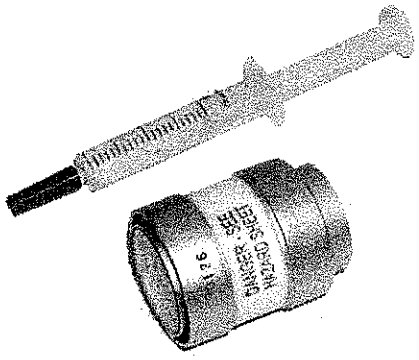


Figure 9: Lamp & thermal compound

Important!

Use only thermal compound delivered with the spare part Xenon Lamp!

Avoid putting thermal compound on the face of the bulb!

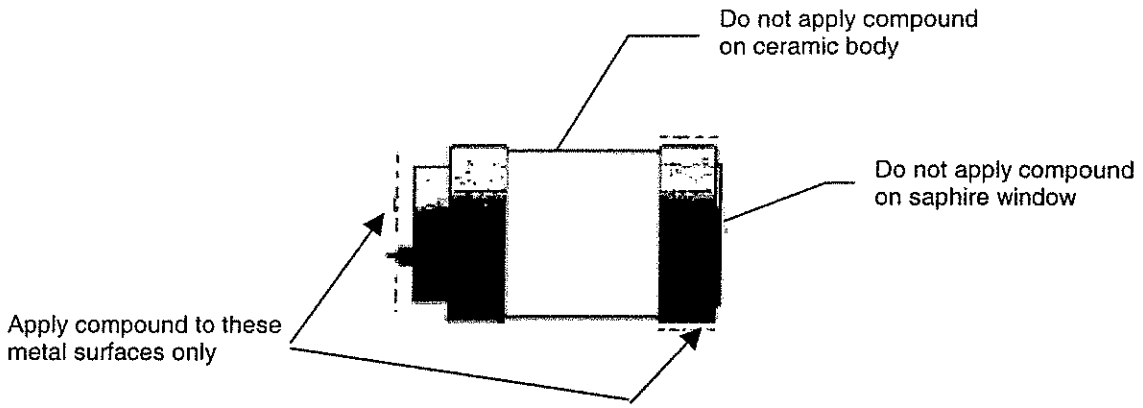


Figure 10: Defined surfaces for the compound

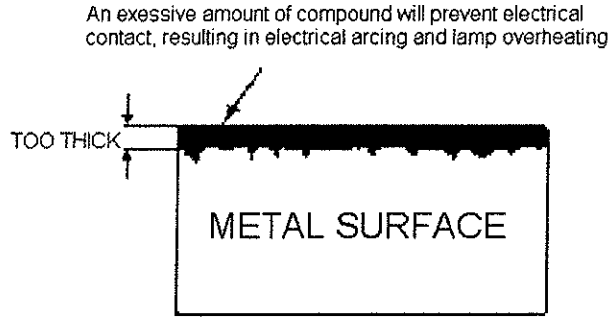

An exessive amount of compound will prevent electrical
contact, resulting in electrical arcing and lamp overheating
TOO THICK
METAL SURFACE

Figure 11: Incorrect method

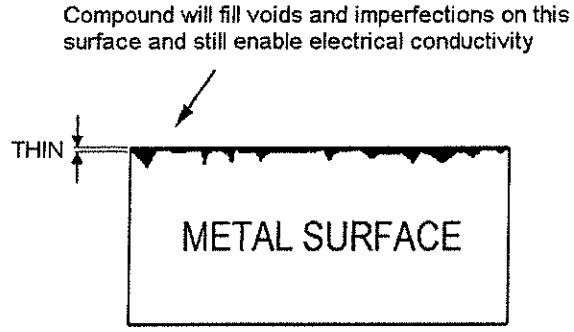

Compound will fill voids and imperfections on this
surface and still enable electrical conductivity
THIN
METAL SURFACE

Figure 12: Correct method

Apply a thin coat to the surface indicated in Figure 10. Wipe the surface with a dry lint-free tissue paper after applying the compound. See Figure 11, Figure 12 and Figure 13 to put the correct amount of compound. Do not get any compound on the lens or ceramic body.

If you do, remove it with a dry, lint free tissue paper or if necessary, moisten tissue with Xylol.

CAUTION!

Because of the poor electrical and thermal conductivity of the compound in comparison to metal, extremely thin layers of this compound must be used (just eliminate the air between the surfaces).

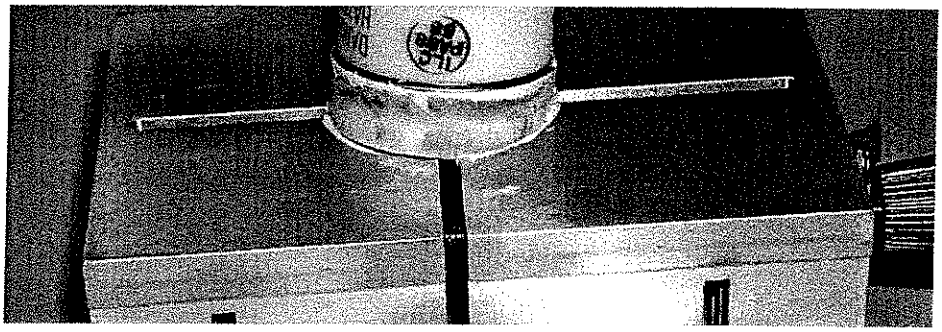


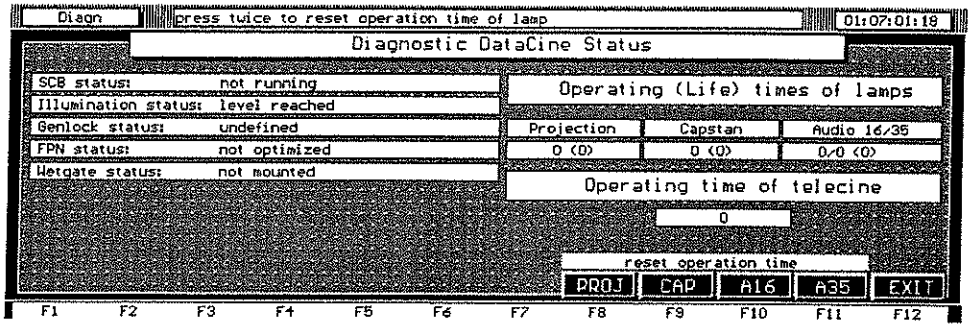
Figure 13: Lamp with too much compound

4.4. Read out and Reset Life Time of Projection Lamp

The lifetime of the Xenon lamp is displayed in the menu Diagnostics.

If a Functional Control Panel is available:

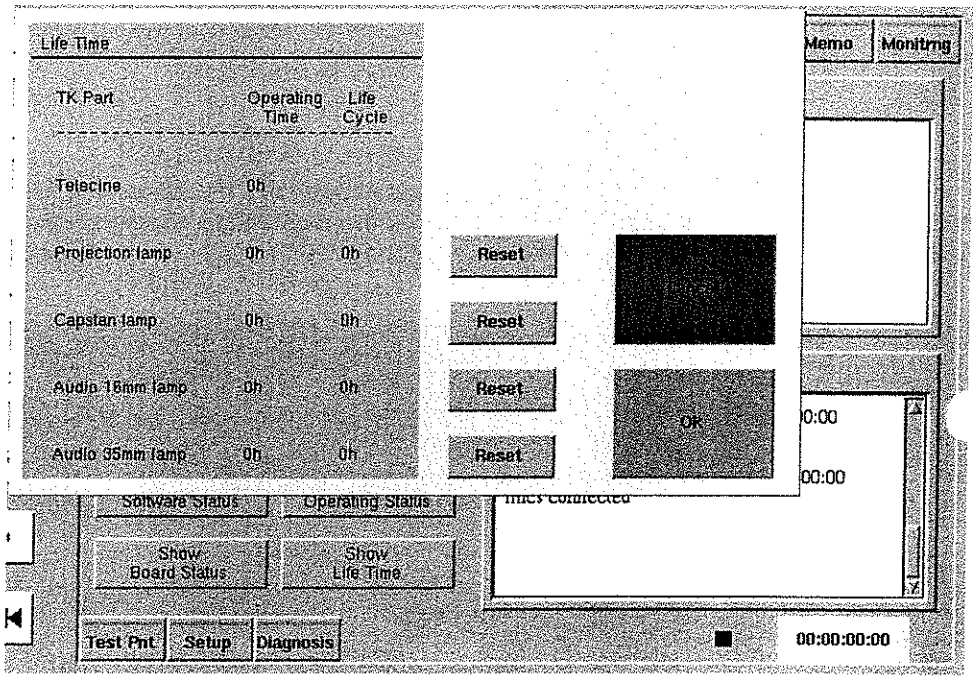
Select Menu Diagnostic – status display



If a Graphical Control Panel is available:

Select Menu Monitoring – submenu Diagnosis

Press – button "Show Life Time"



In case a Xenon Lamp is replaced:

1. Read out life time of the exchanged lamp
2. Reset life time "Projection lamp"
3. Press OK button

5. Maintenance of the Light Path

Attention! Observe Safety Instructions from page 9!

A periodic cleaning of the optical filters in the light path will remove thin dirt film covering the surfaces of the lenses and filters, which reduces the transparency of the optical parts and therefore the light intensity on the CCD sensors.

Clean all optical lenses and filters **every 4 weeks** with lint-free cleaning cloth and use only isopropyl alcohol for cleaning. Wear always gloves. A solution of mild detergent and water may be used to remove oily fingerprints prior to a final cleaning with alcohol. Use clean, lint free wipes and swab once, in one direction only, replacing the wipe with a new one after each rub.

See chapter 6.3 of the Operation Instructions Manual SDC 200/2001 for cleaning the light path - especially chapter 6.3.7 "Cleaning of Condenser Lens 2" - and also chapter 6.4 "Cleaning of the Optical Block"

5.1. Cleaning the Integration Cylinder

To avoid damage to the reflective coating it is highly recommended to clean the film gate integration cylinder using these instructions.

All required cleaning items are supplied with the basic accessory kit, which was supplied with the Spirit DataCine film scanner.

1. Remove the film gate from the Lens Gate Assembly.

2. Blow away the dust in the white-coated integration cylinder with "Dustaway" or a similar product.

Important! - ***Do not shake the can beforehand!***
- ***Use the can only in normal upright position!***
Reason: Air jet should not contain propellant fluid.

3. Blow the air jet alternately through all openings of the integration cylinder until no dust is left.

Important! - Minimum spraying distance 2 cm.

4. Clean the exit port of fiber optic with an optical cleaning cloth.

Film Gate

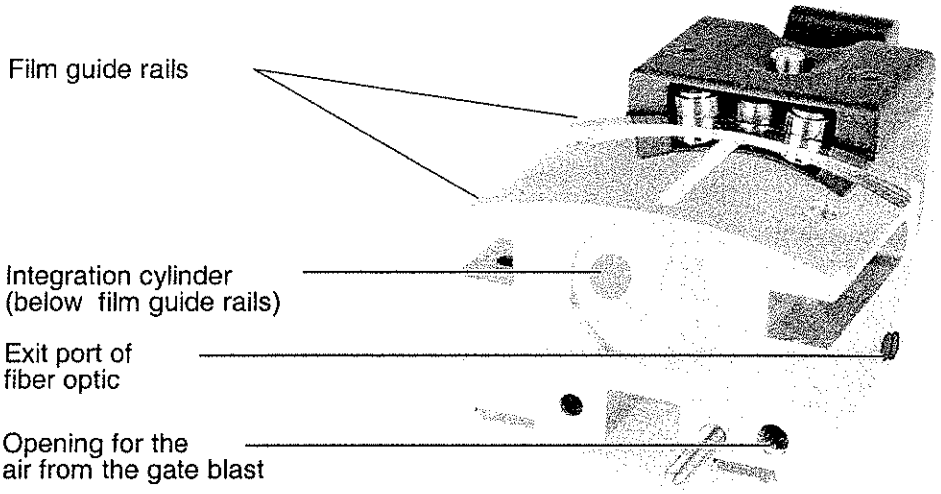


Figure 14: Removed Film Gate

WARNING!
Maximum air pressure for cleaning is 1 bar (14.2 lb/sq.inch) at a distance of 2 cm. Higher pressure causes damage to coating!

Under no circumstances use high-pressure air guns.

If the cleaning instructions are not observed, the gate block can be damaged. This will have high repair costs in consequence.

5.2. Check the external Gate Blast Compressor

Gate blast unit requirements, see also chapter 2.5

- Use only oil free and dry air supply from the external compressor
- Check your compressor regularly:
- 3 ... 7.5 bar (40 ... 100 lb/sq.inch)
- Pre-filtered air (max. 40 μm particle size)
- Less than 80% relative air humidity
- Required air flow 40 l/min per Spirit DataCine film scanner

5.3. Check the Spirit DataCine Gate blast Unit

- Adjust the air pressure to 0.3 bar (4 lb/sq.inch) in play mode
- Change the air filter regularly!
- Empty water collector regularly!

5.4. Change the Filter Mats of AIH & Rack 2

Failure to do this may result in heat damage to the CCD sensors!

It is strongly recommended to change the air filter for the AIH (that one between Racks 2 and 3) and the Rack 2 air filter regularly, at least within a period of one to three months depending on the environmental conditions, to ensure that a good air flow is maintained through the Spirit DataCine film scanner.

A clogged AIH air filter causes the CCD Sensors to run hot; this can seriously shorten the life of the sensors!

5.4.1. Exchanging the AIH Air Filter

1. Switch off the Spirit DataCine.
2. Open the front doors of the Racks 2 and 3.

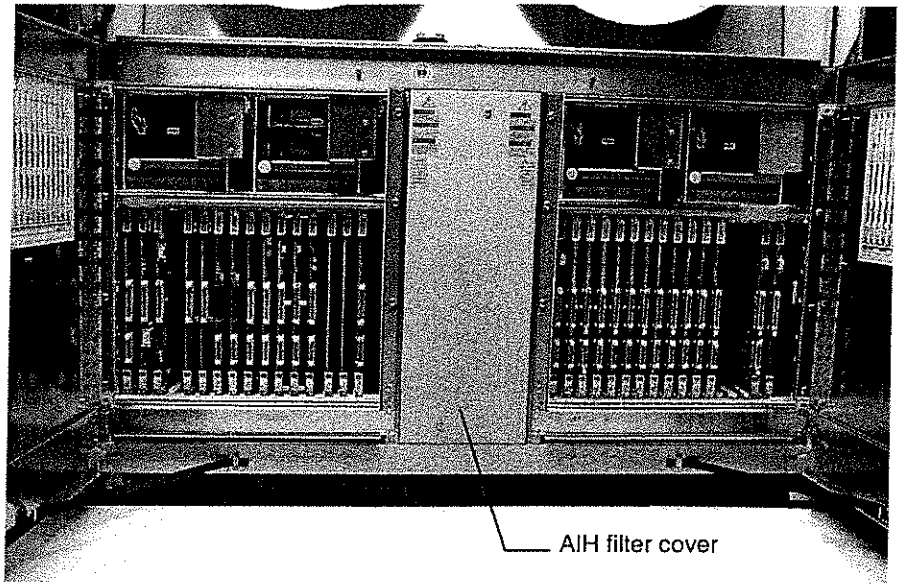


Figure 15: Spirit DataCine Racks 2 & 3

3. Unscrew the cover of the AIH filter.

4. Remove AIH filter and exchange it for a new one.

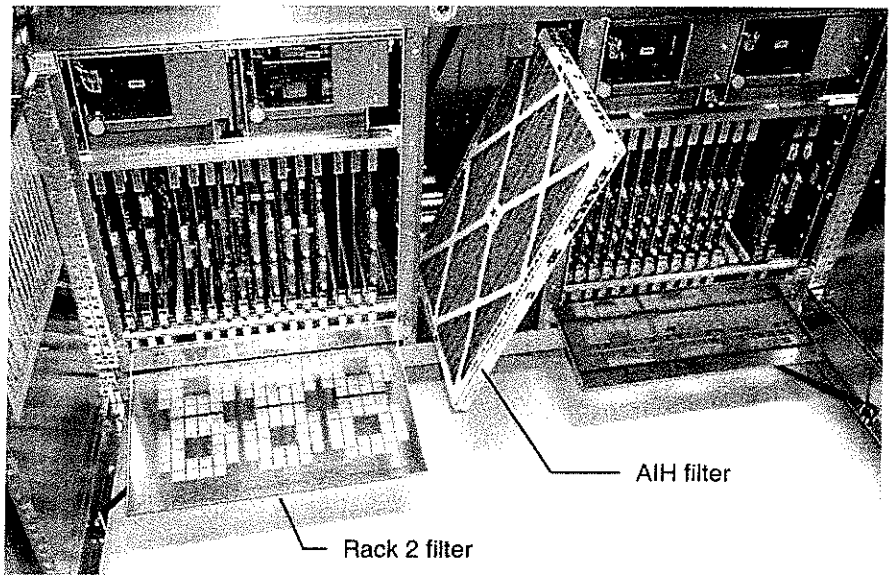


Figure 16: Air filters AIH & Rack 2

5. Pay attention to the AIH filter airflow direction. It is marked with an arrow on the filter edge.

Attention!
Do not re-install used or cleaned filter back to front, because dust particles can be sucked into the illumination channel!

5.4.2. Change the Rack 2 Filter

1. Pull on the front side of the film scanner at the gripping ledge of the air filter and remove it.
2. Remove the Filter mat from the frame.
3. Cautiously blow out the filter mat or wash it in warm water. Alternatively exchange the filter by a new one.

Filters are included in the filter & battery set
Thomson Multimedia order no.: 2 128 102 112

6. Disposal of used Lamps

THOMSON Multimedia does not recommend the use of the lamp for more than 2000 operating hours.

We recommend the following procedure for disposing of a used lamp

- Wait for lamp to reach room temperature (approx. 30 minutes).
- Protect your eyes with safety glasses.
- Take lamp and turn the nipple protruding from the back of the lamp away from your body.
- Take a wire cutters and snip off the nipple.
- A small amount of gas will escape from the lamp.
- The lamp can now be safely disposed of.

7. Spare Parts

Type	Designation	THOMSON Multimedia Order no. new part	THOMSON Multimedia Order no. exch. part
FH 6907	Xenon Lamp Y1711	0 128 690 710	
	Lamp Y1711 with heat sink	3 119 100 267	2 128 102 115
FH 1921	Spare lamp house incl. heat sink and Xenon bulb	0 128 192 110	
	Filter & Battery Set	2 128 102 112	

Note!
The spare lamp house FH 1921 offers a fast and easy lamp replacement. While the film scanner is already back in operation with the spare lamp house, a skilled person has time enough to carefully exchange the defective lamp in the heat sink.

8. Handling of Warranty Claims

8.1.1. Dear Customer!

If the lamp was purchased from Thomson Multimedia or a Thomson authorized agent and you wish to submit a warranty claim on the lamp, please complete (in full) the "Return Sheet" found on the next page and send it back with the defective Xenon lamp to your local Thomson Multimedia National Sales Organization – NSO or Thomson authorized agent.

Please note the serial number of the lamp (indicated at the metal ring of the lamp), clearly describe the problem, indicate the operating hours of the lamp (see chapter 4.4) and provide the invoice or delivery note number of the lamp purchased from your Thomson Multimedia NSO. This will assist us in expediting your warranty claim.

A credit note or replacement based on a warranty claim can only be given after the complained lamp has been inspected by Thomson.

Attention!
The 500 hours warranty is only given for a lamp, which had been operated at a current of 18 to 22 Amps. A warranty exchange or refunding is not possible, if the lamp had been operated with excessive lamp current, > 22 Amps.
The current range used for operating the lamp can be detected during inspection.

8.1.2. Dear Local Thomson Multimedia National Sales Organization and Thomson authorized Agent!

Please complete the appropriate fields of the customer filled in "Return Sheet" with the ICC invoice and delivery note numbers.

Send both, the "Return Sheet" including the defective lamp, to

BTS Media Solutions GmbH
Wareneingang
Brunnenweg 11
D-64331 Weiterstadt
Germany

BTS Media Solutions GmbH
Return Sheet for Xenon Lamps

Date:

Warranty Claim

To:
Thomson Multimedia
National Sales Organization

Street	
Zip Code	
City	
Country	
State	

Customer Ref. No.	(if available)
Your Name	
Street	
Zip Code & City	
Country	
Telephone	
Fax	
Email	

Product Data

Xenon lamp type		LX300F		Y1711
Serial number of the Xenon lamp				
SPIRIT serial no. & operation time				
Installation date of the Xenon lamp				
Removal date of the lamp				
Service contract number	(if applicable)			
Return delivery address after examination, if different from above				

Customer's Invoice & Delivery Note no.:

Invoice no.	
Delivery note no.	

Detailed Fault Description (Please be more specific than just "defect", "broken", "not working" or similar)

Lamp does not ignite		Yes		No
Not enough light from the lamp		Yes		No
Lamp/Light flicker		Yes		No
Lamp problems with film type		8/16mm		35mm
Lamp operating hours:				
Film speeds with lamp problems				
Average lamp current with KODAK TAF film	PRINT = ... A, COLOR NEG =..... A, IMED = ... A			

☐ Problem is consistently present
☐ Problem is random

☐ Temperature problem

Only for Thomson Multimedia NSO!
Please complete the form with ICC invoice and delivery note numbers

ICC Invoice no.:	
ICC Delivery note no.:	

and send this form including the defective lamp to

BTS Media Solutions GmbH
Wareneingang
Brunnenweg 11
D-64331 Weiterstadt / Germany

Please fill the requested information in the gray marked fields. Claims will be rejected in case of missing information!

Published by

BTS Media Solutions GmbH

Brunnenweg 9
D-64331 Weiterstadt, Germany
P.O. Box 1165

Tel: +49 (0) 6155-870-0
Fax: +49 (0) 6155-870-300

Web Sites
Internet: www.thomsonbroadcast.com
www.imagingsystems.de
Intranet: www.weiterstadt.thmulti.com

Trademarks

All product names mentioned in this manual are the trademarks of their respective owners.

Copyrights

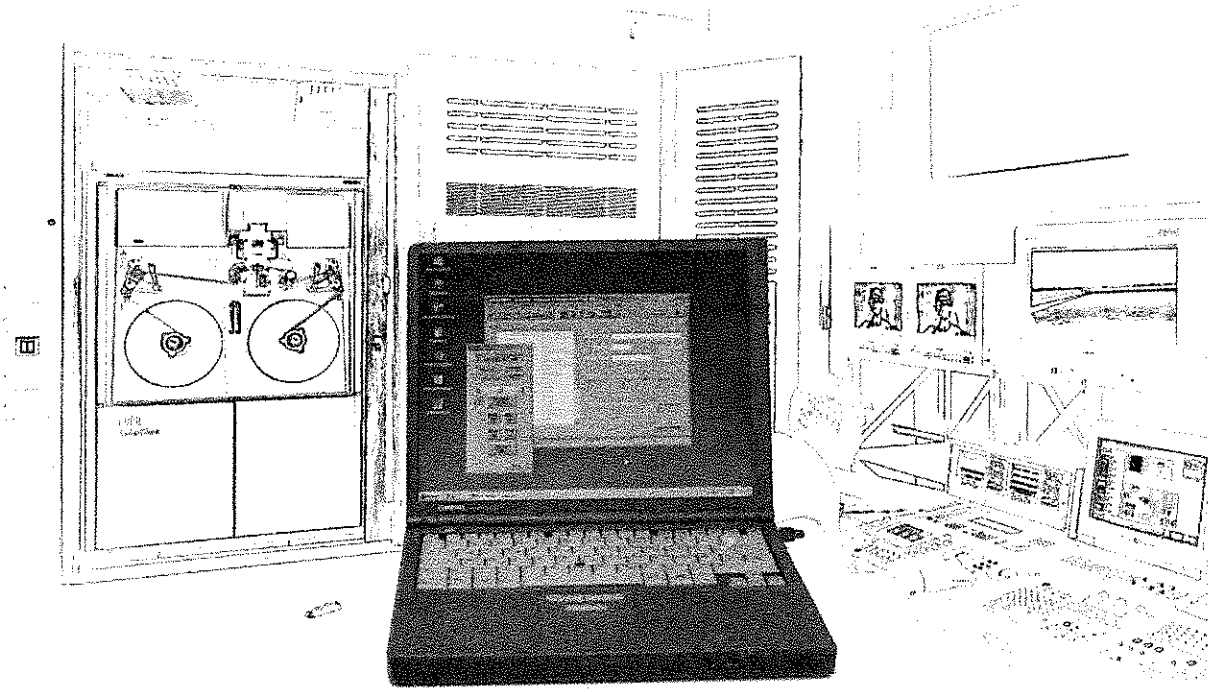
Information in this document is subject to change without notice.
This document and any updates and/or supplemental information, including any copies thereof, cannot be reproduced, neither communicated to a third party, without written authorization from **THOMSON multimedia Broadcast Solutions**.

Please notify THOMSON multimedia Broadcast Solutions of any errors in this document. We also would appreciate any comments you have to improve this manual.

© BTS Media Solutions GmbH 2001. All rights reserved.

SDCMAINT Diagnostic Kit

FH 1660



Customer's Manual

Diagnosis & Maintenance Tool
incl. Access Control PC-Duo
& Lookup Table Generation
for Thomson Multimedia Film Scanners

Software Version 2.3
6th Revision Dec. 2002

THOMSON MULTI MEDIA
BROADCAST SOLUTIONS

CONTENTS

1. General 3

1.1 Introduction 3
1.1.1 Contents of Diagnostic Kit FH 1660 3
1.2 PC hardware requirements 4
1.3 PC software requirements 4
1.4 condition for installation of Diagnostic Kit FH 1660 4
1.5 Abbreviations 4

2. Installation 5

2.1 Software installation 5
2.1.1 Installation of diagnosis & maintenance tool SDCMAINT 5
2.1.2 Installation of remote control software PC Duo 7
2.2 Connection to the networks 10Base-2 or 10Base-T 8
2.3 Starting the application 10
2.4 Registration key 10

3. Using the SDCMAINT toolbar 11

3.1 Record iMCS traffic 11
3.2 Open iMCS logfile 11
3.3 Record SDC 2000 system messages 11
3.4 Open system messages logfile 11
3.5 Connect diagnosis terminal 11
3.6 Download to a single unit 12
3.7 Complete system download 12
3.8 Download lookup tables 12
3.9 Mini control panel 12
3.10 Overview system check 12
3.11 Interactive system check 12
3.12 Show software versions 13
3.13 View and modify product options 13
3.14 Machine serial No. request 13

4. Using the SDCMAINT pulldown menus 14

4.1 Pulldown menu „iMCS“ 14
4.1.1 iMCS Menu item „Disable filter“ 14
4.1.2 iMCS Menu item „Filter select...“ 14
4.1.3 iMCS Menu item „Display select...“ 17
4.1.4 iMCS Menu item „Record new...“ 19
4.1.5 iMCS Menu item „Open...“ 20
4.1.6 iMCS Menu item „Save“ 21
4.1.7 iMCS Menu item „Save as...“ 21
4.1.8 iMCS Menu item „Send...“ 22
4.1.9 iMCS Menu item „Print...“ 23
4.1.10 iMCS Menu item „Print setup...“ 23
4.1.11 iMCS Menu item „Exit“ 23
4.2 Pulldown menu „Messages“ 23
4.2.1 Messages Menu item „Record new...“ 24
4.2.2 Messages Menu item „Open...“ 25
4.2.3 Messages Menu item „Save“ 26

4.2.4 Messages Menu item „Save as..." ... 26
4.2.5 Messages Menu item „search a description" ... 26
4.2.6 Messages Menu item „Print..." ... 27
4.2.7 Messages Menu item „Print Setup..." ... 28
4.3 Pulldown menu „Download" ... 28
4.3.1 Download Menu item „Lookup tables" ... 28
4.3.2 DOWNLOAD Menu item „Single unit" ... 35
4.3.3 Download Menu item „Complete system" ... 36
4.3.4 Download Menu item „Copy & convert from A:" ... 38
4.3.5 Download Menu item „Copy & convert from B:" ... 38
4.3.6 Download Menu item „Copy & convert from C:" ... 38
4.3.7 Download Menu item „Edit script file" ... 38
4.4 Pulldown menu „Check" ... 39
4.4.1 Check Menu item „Telecine status" ... 40
4.4.2 Check Menu item „Software versions" ... 42
4.4.3 Check Menu item „Board versions" ... 42
4.4.4 Check Menu item „Operating time" ... 44
4.4.5 Check Menu item „Overview system check" ... 45
4.4.6 Check Menu item „Interactive system check" ... 47
4.5 Pulldown menu „Adjust" ... 52
4.5.1 Adjust Menu item „Message weighting" ... 52
4.5.2 Adjust Menu item „Real-time clock" ... 53
4.5.3 Adjust Menu item „Mini control panel" ... 53
4.5.4 Adjust Menu item „Monitor link" ... 54
4.5.5 Adjust Menu item "Option Control" ... 55
4.5.6 Adjust Menu item „Restart all units" ... 55
4.6 Pulldown menu „SYSDUMP" ... 56
4.6.1 Store system dump ... 56
4.6.2 Reload system dump ... 57
4.6.3 Analyze system dump ... 58
4.6.4 Store machine data ... 59
4.6.5 Reload machine data ... 60
4.7 Pulldown menu „Options" ... 61
4.7.1 Options menu item "LAN Adapter select" ... 61
4.7.2 Options Menu item „LAN driver mode" ... 62
4.7.3 Options Menu item „CPU speed test" ... 62
4.7.4 Options Menu item „Registration" ... 62
4.7.5 Options Menu item „Internet Addresses" ... 63
4.7.6 Options Menu item „Service mode" ... 64
4.7.7 Options Menu item „NDIS properties" ... 64
4.8 Pulldown menu „Help" ... 66
4.8.1 Menu item „Contents" ... 67
4.8.2 Menu item „Search for help on..." ... 67
4.8.3 Menu item „How to use help" ... 67
4.8.4 Menu item „SDCMAINT history" ... 67
4.8.5 Menu item „About SDCMAINT" ... 68

5. Typical operations ... 69

5.1 Load the new SDC 2000 controller software from floppy to the harddisk of the PC. ... 69
5.2 Start and perform the download function of SDCMAINT ... 69
5.3 Enable remote control access with PC DUO for Thomson Service ... 70

6. Index ... 71

1. GENERAL

1.1 INTRODUCTION

The Diagnostic Kit FH 1660, operating in connection with the

- **Sprit DataCine film scanner SDC 2000 / 2001,**
- **Specter Virtual DataCine VDC 2000,**
- **Shadow Telecine STE-B,**

is designed to

- **monitor iMCS protocol**
  (see section 4.1.4 „iMCS Record new..")
- **monitor SDC/STE/VDC/SGR/GCP system messages**
  (see section 4.2.1 „Messages Record new..")
- **enable remote SDC/STE/VDC software loading**
  (see section 4.3 „Download")
- **check the SDC/STE/VDC automatically**
  (see section 4.4.5 „Overview system check")
- **check and modify SDC/STE/VDC system parameters**
  (see section 4.5 „Adjust")
- **store and reload all system parameters**
  (see section 4.6 „System state dump")
- **view and enable additional software options**
  (see section 3.13)
- **view and download lookup tables for data output**
  (see section 4.3 „Download")
- **provide remote access service by dial up networking**
  (see section 2.1.2 „Installation of remote control software PC-DUO")
- **operate according the year 2000 compliance**

1.1.1 CONTENTS OF DIAGNOSTIC KIT FH 1660

The Diagnostic Kit FH 1660 - Order No.: 0 128 166 000 consists of:

• DS 0153	Diagnosis & Maintenance Tool SDCMAINT *
• FH 1661	PC-DUO Remote Control Tool *
•	LAN Cable 10 m
• FU 0058	This Customer's Manual FU 0058

* on CDROM disk

1.2 PC HARDWARE REQUIREMENTS

The Personal Computer to be used with the Diagnostic Kit must fulfill the following requirements:

- Desktop PC or notebook with a CPU i486®, Intel Pentium® or compatible
- CDROM drive
- VGA graphics adapter with a minimum of 640x480 pixels and 16 colors (recommended are 800x600 or 1024x768 pixels and 256 colors)
- 32MB RAM
- Ethernet card (ISA, PCI, PCMCIA or Pocket Adapter) with a BNC connector (10base2) and/or a RJ45 connector (10baseT)
- Modem (only for remote control access with PC-DUO)

1.3 PC SOFTWARE REQUIREMENTS

The following software requirements should be considered to run the Spirit DataCine diagnosis & maintenance tool:

- minimum of 6 MB space on a local harddisk
- Operating System Windows95, Windows98, Windows98SE, Windows ME, Windows NT, Windows 2000 or Windows XP
- A Windows – compatible network device driver for the used network adapter (supporting the NDIS 3.1 specifications)

1.4 CONDITION FOR INSTALLATION OF DIAGNOSTIC KIT FH 1660

- SDC 2000 / 2001 Software
  All SDC2000/2001 Spirit DataCine film scanners can be maintained with the diagnosis & maintenance tool SDCMAINT.
  From SDC 2000 software version 3.3 and higher, SDCMAINT operates without any limitations.
- STE-B Software
  All STE-B Shadow Telecine film scanners can be maintained with the diagnosis & maintenance tool SDCMAINT.
- VDC2000 Software
  All VDC2000 Specter Virtual DataCine film players can be maintained with the diagnosis & maintenance tool SDCMAINT.

1.5 ABBREVIATIONS

ASC	Analog Signal Controller (Rack 1)
ESC	SteadyScan Controller
FCP	Functional Control Panel
FDC	Filmdeck Controller (Rack 2)
GCP	Graphical Control Panel
GWC	Gateway Controller (Rack 2)
iMCS	internal Machine Control System

LUT	Lookup table
MCF	Multicast Group Film (units which use film time code)
MCS	Multicast Group Studio (units which use studio time code)
MCU	Multicast Group All Units
MPA	Multicast Group Panels (units with user interface)
MSY	Multicast Group System
PC	Personal Computer
PC-DUO	Remote Control Tool (Dial-up networking)
Rem 2 & 3	Remote Interfaces for „Telecine Controllers“
SDC	Spirit DataCine Film Scanner
SDCMAINT	Spirit DataCine Diagnosis & Maintenance Tool
SGR 2000	Scream Grain Reducer
SPC	Spatial Processing Controller (Rack 3)
STE	Shadow Telecine
TC	Time Code
TK	Telecine
VDC	Virtual DataCine
VGA	Video Graphics Adapter

2. INSTALLATION

2.1 SOFTWARE INSTALLATION

2.1.1 INSTALLATION OF DIAGNOSIS & MAINTENANCE TOOL SDCMAINT

The SDC 2000 Diagnosis & Maintenance Tool SDCMAINT is distributed on a CDROM disk.

- Insert the CDROM into your CD drive. If you have the AUTORUN feature of Windows95 activated, the Setup dialog will start automatically.

- Otherwise you have to start the installation by executing AUTORUN.EXE. Therefore, either double-click the file icon in the Explorer or select the menu item RUN with parameters

  <cd-drive>:\AUTORUN.EXE.

- In the Setup dialog you have to push the button „Install SDCMAINT“.

Start the installation of SDCMAINT V2.0 by double-clicking the icon “SDCmaintSetup.exe”. A welcome window shows the actual version of the setup package and requests to continue. During the following setup process, you have to select one of your local hard disks and a convenient directory root as destination for the application files. The default path is "C:\Program Files\SDCMaint32\". Follow the instructions given by the installation program and read the Software License Agreement carefully.

When the Setup closed successfully you can start SDCMAINT without a need for rebooting. The first time of execution, a popup window requests to select one of the installed network drivers. Select the name of the network adapter you want to use for the DataCine maintenance. It can be the same adapter you use for the office network communication. The "Dialup-adapter" or "DFÜ-Adapter" sometimes shown in the list is not supported.

If no error occurs, you should get the main window of SDCMAINT with the receive mode "all telegrams" in the toolbar. When a SPIRIT, SPECTER or SHADOW is connected, the product type and the serial no. should be

displayed. Also the activity counters of the built-in units should be incremented every second.

2.1.1.1 SOLUTION OF PROBLEMS

If you get an error message after selecting a network driver, SDCMAINT could not communicate with the selected adapter and you are asked to select another one from the list. The reason may be one of the following:

- The selected driver is inactive, because the corresponding adapter has been removed from the PC or notebook.
- The selected driver is disabled in the "Device Manager" dialog. Please enable it previously. (Perhaps this was done for the SDCMAINT 1.x version.)
- The selected driver was installed improperly. The best solution is to remove this driver in the "Device Manager" dialog and to reboot the system and let the "Plug & Play" feature of Windows95 do its work.
- If you are running Windows NT, Windows 2000 or Windows XP, you must be logged-in as Administrator or you must be member of the administrators group to get the rights to connect to the network adapter.
- If you are running Windows NT, Windows 2000 or Windows XP, perhaps the NDIS drivers are configured incorrect in the registry. To clean the registry, please execute the tool "PCARMDRV.EXE" in the SDCMAINT root folder and try to start SDCMAINT again. Repeat the last sequence if it failed.

2.1.1.2 UPGRADES FROM 16-BIT TO 32-BIT VERSION

SDCMAINT V2.2 does not need any longer a 16-bit NDIS driver and the operating system Windows95 to be started in "Save mode". It is a full 32-bit application with all the advantages like long filenames, Windows95 -supported network drivers and a much better performance and stability. Nearly all network adapters and PCMCIA cards are now suitable to connect to a SPIRIT DataCine film scanner, a SPECTER Virtual DataCine or a SHADOW Telecine.

If you already used the previous 16-Bit version of SDCMAINT up to V1.3 (build 198), you can install the version 2.2 additionally into another folder and keep the older one until you are sure that all is working ok. Keep in mind that you must not boot your PC or notebook in Windows "Save mode". Also take care not to have disabled the network device driver or PCMCIA slot device driver in your Device Manager menu.

2.1.2 INSTALLATION OF REMOTE CONTROL SOFTWARE PC DUO

The control software PC-DUO runs under Windows and permits remote control access from an external diagnostic PC, e.g. by Thomson service.
A modem is required which is not part of this kit.

PC-DUO is distributed on the CDROM disc of the Diagnostic Kit FH 1660.

- Insert the CDROM into your CD drive. If you have the AUTORUN feature of Windows95 activated, the Setup dialog will start automatically.

- If you have the AUTORUN feature of Windows95 deactivated, you have to start the Installation dialog by executing AUTORUN.EXE. Therefore, either double-click the file icon in the Explorer, or select the menu item RUN with parameters

  <cd-drive>:\AUTORUN.EXE.

- In the Setup dialog, you have to push the button „Install PC-DUO".

After installation start, you get a welcome window where you have to push the "Continue" button. Then you will see a dialog window where you may modify the default configuration.
Normally, you should leave all the parameters at their default values. But you can modify the installation path and perhaps the name of your diagnosis PC. Then press the "Continue" button and acknowledge the necessary disk space with "O.K.".
Please answer the question whether you want to load the bridge DLL at Windows start with yes to have the remote-controlled feature available.

At the end of installation, you get a dialog window concerning your modem link. Select your modem type from the list, the COM port where it is connected and the baud rate to be used at this port.

The question dialog whether to run the Configurator you may answer with „NO".

Then restart your PC with a connected modem to activate the remote-controlled client software. Remote access by Thomson Multimedia is now available.

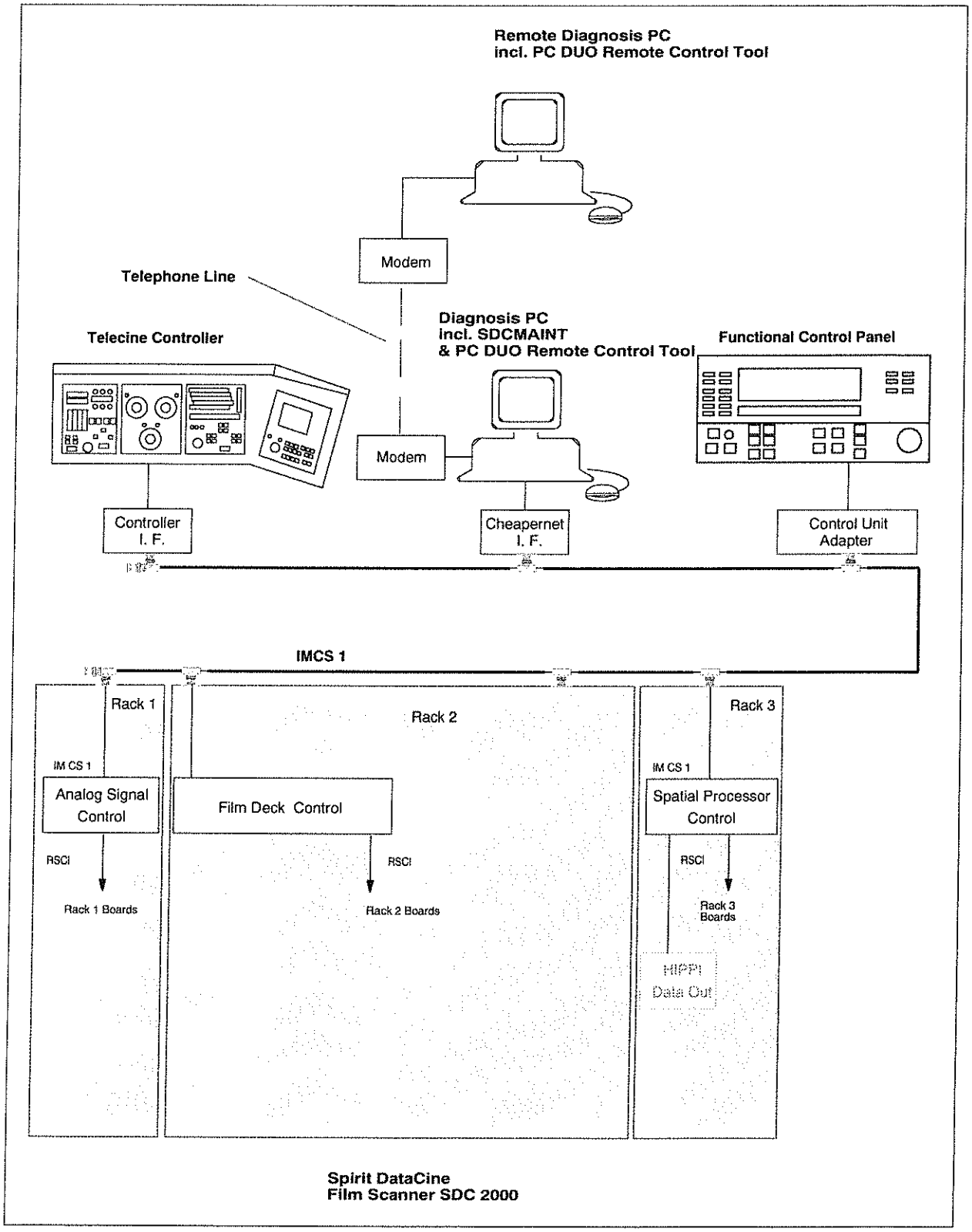
If no modem is connected or switched off at reboot, you will see a short error message and the remote software will not be activated at this session.

For further information about PC-DUO, please use the online help or see the manual stored in the postscript file pcd302a4.ps on CDROM the Kit FH 1660.
Use a standard postscript viewer or postscript printer for a readable version of that user manual.

2.2 CONNECTION TO THE NETWORKS 10BASE-2 OR 10BASE-T

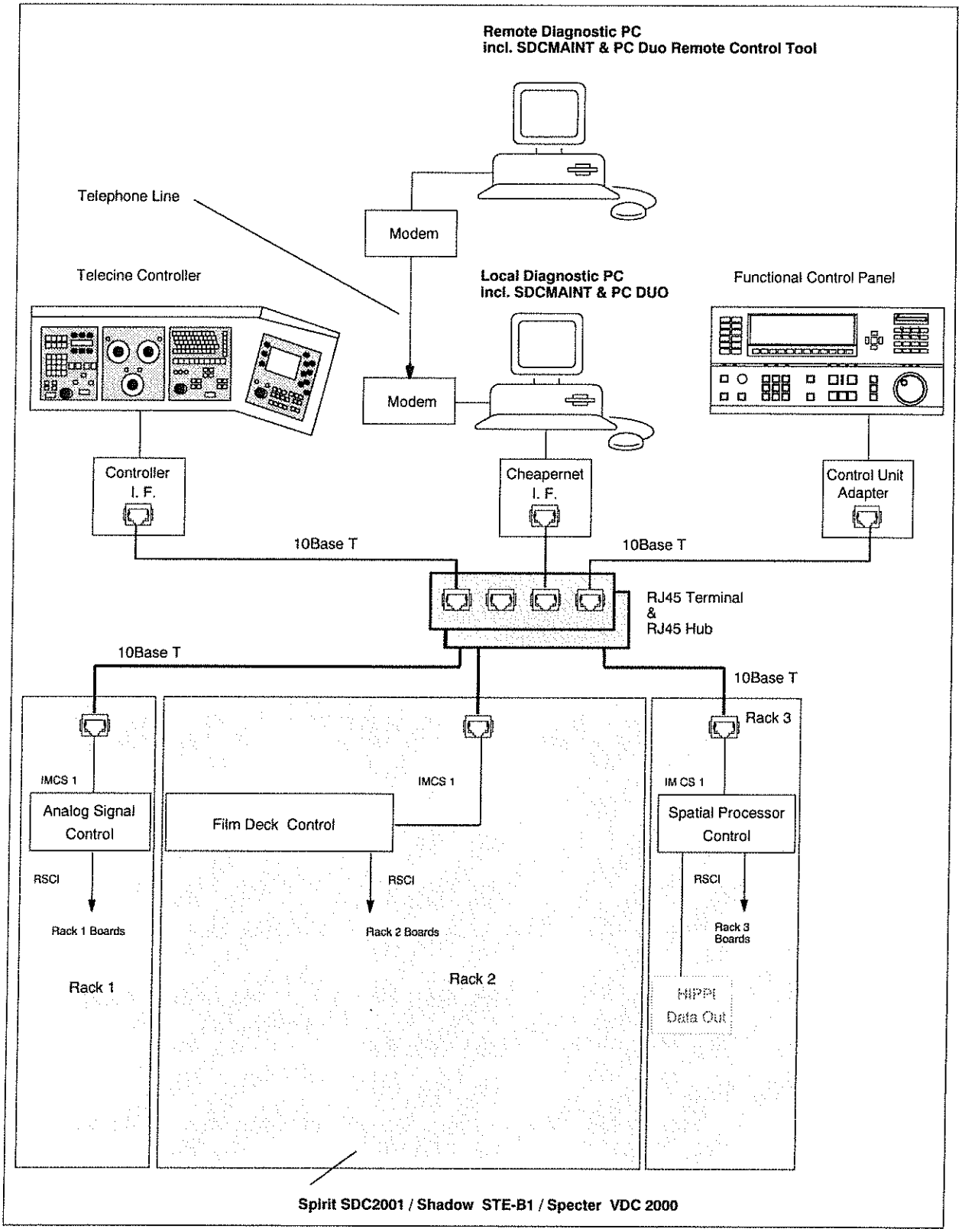
Block diagram SDC 2000 / VDC 2000 with diagnostic PC and remote control access via service PC.

Coax cable 10Base-2 connection!



Block diagram SDC 2001 / STE-B1 / VDC 2000 with diagnostic PC and remote control access via service PC.

RJ 45 / 10Base-T connection!

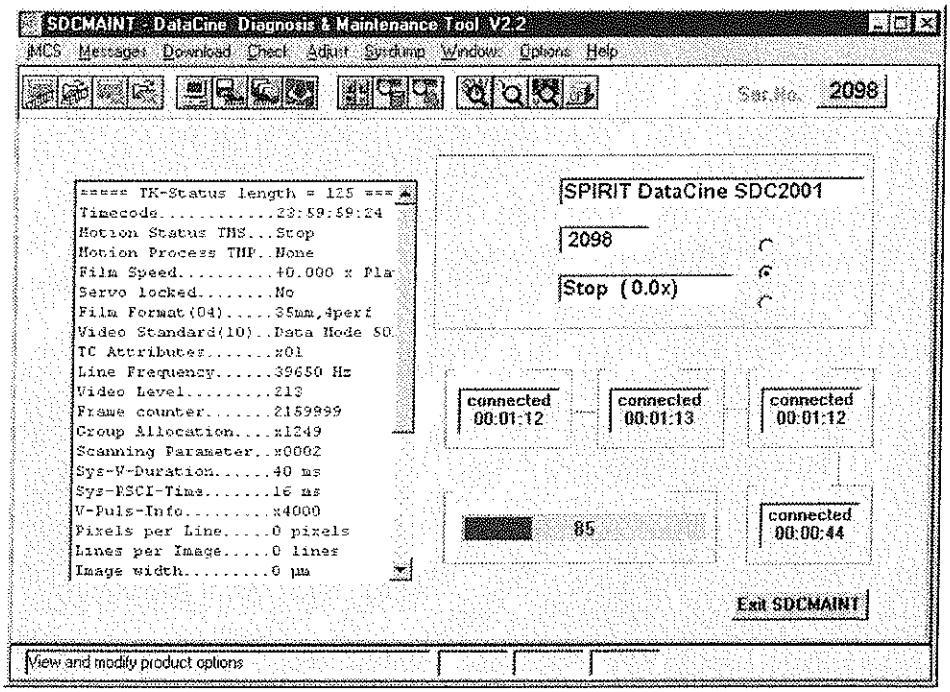


To connect the PC with the diagnosis software SDCMAINT to a Spirit DataCine film scanner, proceed as follows:

1. Locate a 50Ω terminator plug at the iMCS network (at the Functional Control Panel CP1, at the Pogle or DaVinci panel or at the SDC 2000 rear panel).
2. Replace this terminator with the provided PC LAN cable FH 1667.
3. At the open end of this cable plug on a BNC-T connector.
4. At the other side of the BNC-T connector put on the 50Ω terminator plug or extend to other devices.
5. Plug the BNC-T connector directly onto the PC Ethernet card's BNC connector.

2.3 STARTING THE APPLICATION

You can start the application SDCMAINT by double-clicking the file C:\Program Files\Sdcmaint32\Sdcmaint.exe in the Explorer of Windows. Alternatively, you can double-click the icon of the application in the start menu of Windows.



When a SPIRIT, SPECTER or SHADOW is connected, the product type and the serial number should be displayed. Also the activity counters of the built-in units should be incremented every second.

2.4 REGISTRATION KEY

The newly installed application is licensed with a default customer's registration key. You can use the pull down menu item „Options - Registration" to check the actual key or to enter a new one with additional options.

3. USING THE SDCMAINT TOOLBAR

The toolbar is the gray field just beneath the pull down menu bar. It contains nine buttons with icons on it and a mode select field. The buttons are helpful to perform some essential functions faster than using the pull down menus. The elements are described in the next paragraphs.

3.1 RECORD IMCS TRAFFIC

iMCS - Record new

This toolbar button activates a dialog to start viewing and recording all activities on the iMCS network of SDC 2000.

3.2 OPEN IMCS LOGFILE

iMCS - Open

This toolbar button activates a dialog to review or modify a previously recorded log file of all activities on the iMCS network of SDC 2000.

3.3 RECORD SDC 2000 SYSTEM MESSAGES

Messages - Record new

This toolbar button activates a dialog to start viewing and recording all system messages on the iMCS network of SDC 2000.

3.4 OPEN SYSTEM MESSAGES LOGFILE

Messages - Open

This toolbar button activates a dialog to review or modify a previously recorded log file of the system messages on the iMCS network of SDC 2000.

3.5 CONNECT DIAGNOSIS TERMINAL

Adjust - Monitor link

This toolbar button activates a dialog to virtually connect an ASCII terminal to any of the serial diagnosis links of the SDC 2000.
(Remark: This function is only available in Service mode!)

3.6 DOWNLOAD TO A SINGLE UNIT

Download - Single unit

This toolbar button activates a dialog to start a software download to one of the SDC 2000 controller boards.
(Remark: This function is only available in Service mode!)

3.7 COMPLETE SYSTEM DOWNLOAD

Download - Complete system

This toolbar button activates a dialog to start a software download to a sequence of the SDC 2000 controller boards.
(Remark: This function is only available in Service mode!)

3.8 DOWNLOAD LOOKUP TABLES

Download – Lookup tables

This toolbar button opens a dialog that allows to download lookup tables from the PC to the telecine.

3.9 MINI CONTROL PANEL

Adjust – Mini control panel

This toolbar button starts a control panel dialog which allows to perform the basic drive operations.

3.10 OVERVIEW SYSTEM CHECK

Check - Overview system check

This toolbar button opens a dialog window that shows a picture of all boards inside the three Spirit's racks.

3.11 INTERACTIVE SYSTEM CHECK

Check - Interactive system check

This toolbar button opens a dialog window where you can start the execution of a supplied diagnosis script.

3.12 SHOW SOFTWARE VERSIONS

Check – Software versions

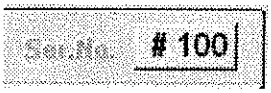
This toolbar button opens a dialog window where you can see the actual software versions of the telecine's microprocessor boards.

3.13 VIEW AND MODIFY PRODUCT OPTIONS

Adjust – Option Control

This toolbar button opens a dialog window where you can view the activated and the available options and you can send a keyword to the telecine to activate another option.

3.14 MACHINE SERIAL NO. REQUEST

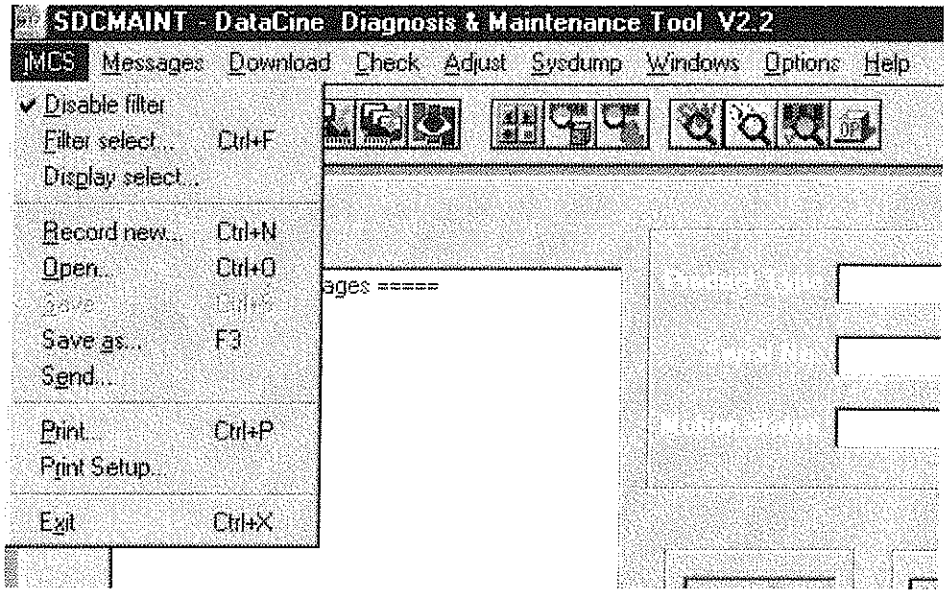


This button at the right side of the toolbar shows the machine serial no. of the connected machine. It is updated when the SDCMAINT application starts and can be updated every time on pushing the button. If no machine is connected, the button will show only a number sign (#).

4. USING THE SDCMAINT PULLDOWN MENUS

4.1 PULLDOWN MENU „IMCS“

The pull down menu iMCS contains all menu items that concern watching, recording and generating telegrams on the SDC 2000 iMCS network (internal Machine Control System). There are several menu items available to perform this task.



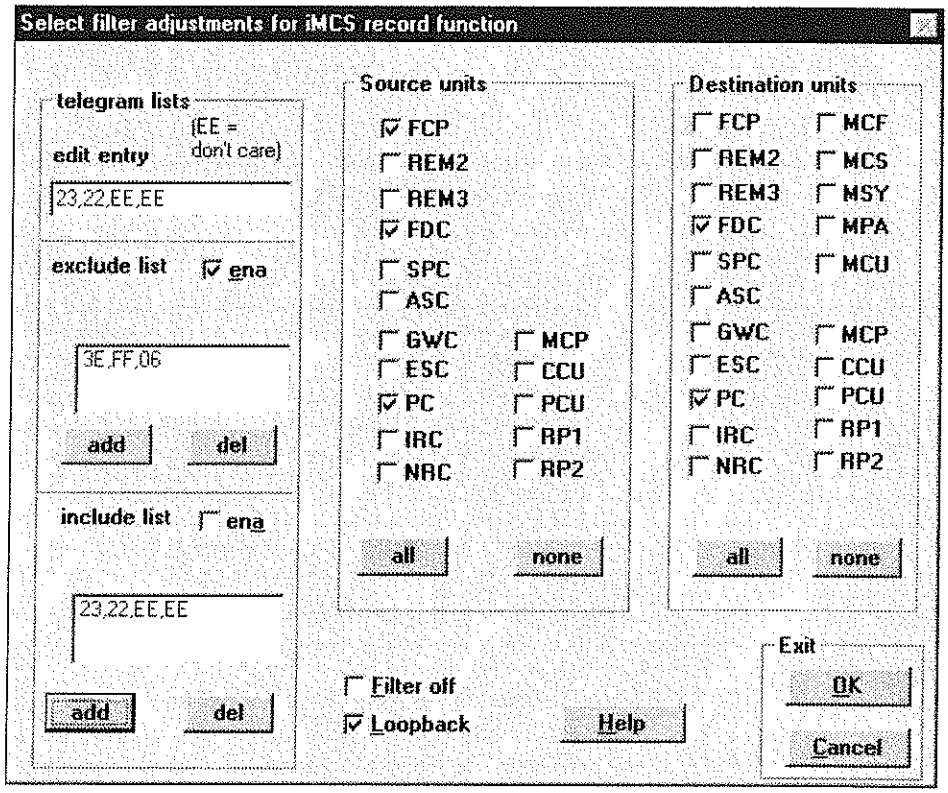
4.1.1 IMCS MENU ITEM „DISABLE FILTER“

This menu item is a toggle switch that controls the filtering of received telegrams. If this item is checked, the filter is disabled and all received telegrams are displayed. If it is unchecked (no check sign in front of it), the filter is activated and only the telegrams selected in the Filter dialog are displayed.

NOTE!
Even if the filter is disabled, only the telegrams, which are enabled through the "receive mode", will be shown (see chapter 3.12 „Receive Mode Selection“).

4.1.2 IMCS MENU ITEM „FILTER SELECT...“

This dialog window allows a wide configuration of the iMCS recorder's filter functions. The filter provides the means to reduce the amount of displayed telegrams in the „iMCS Record new“ dialog. So it will be possible to read only the actually interesting telegrams in real time. Five main filter items are supported:



- **„Filter off"**
  This checkbox allows to disable (if checked) or to enable (if unchecked) the whole telegram filter. The selection does not modify any other adjustment of the filter items. So it is easy to switch between displaying all received telegrams and only those that are currently selected with the other filter items.

- **„Loopback"**
  This checkbox enables receiving the own sent telegrams. This is helpful to measure response times.

- **„Source units"**
  This selection group of nine checkboxes allows to select any source unit in the SDC 2000 iMCS network from where you want to see transmitted telegrams. Only the telegrams sent by the „checked" units will be displayed. The destination of these telegrams does not matter.

- **„Destination units"**
  This selection group of 14 checkboxes allows to select any destination unit or any destination multicast group in the iMCS network where you want to see transmitted telegrams. Only the telegrams addressed to the „checked" units will be displayed. The source of these telegrams does not matter.

- **„Exclude list"**
  This selection group contains a list of up to ten telegrams that should not be displayed in the „iMCS Record new" dialog. This selection item can be separately enabled or disabled by a checkbox.

In this list, only the first bytes for a unique identification must be specified, the others are not verified. The entry in the lists must be done into the „edit entry" field and then added with the „add" button.
Also an entry in the list can be selected and then removed with the „del" button. The syntax of the entry is a two-digit hexadecimal representation of each byte, separated by a comma (,). A special meaning has the hexadecimal value „EE". It is a wildcard byte and represents any byte between „00" and „FF".

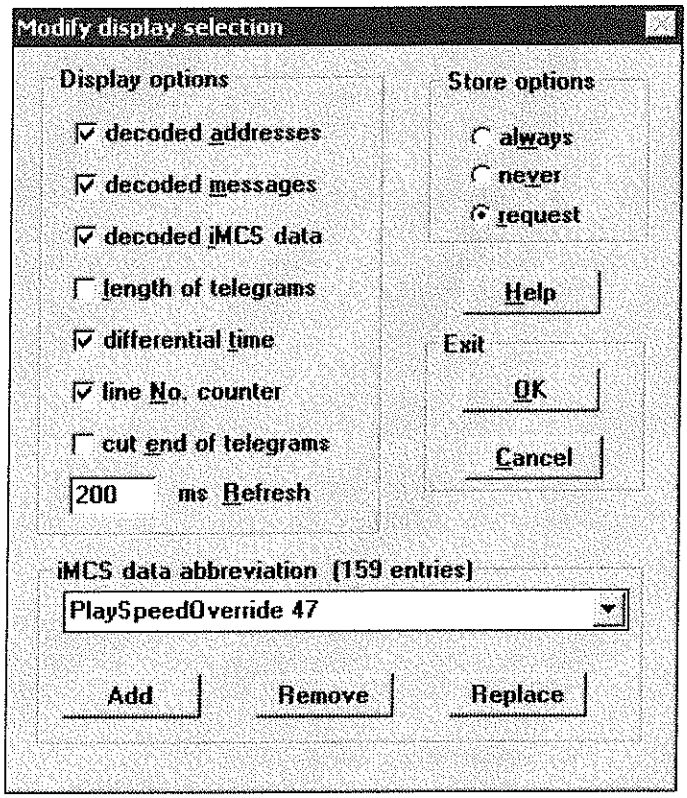
- **„Include list"**
  This selection group contains a list of up to ten telegrams that should only be displayed in the „iMCS Record new" dialog. This selection item can be separately enabled or disabled by a checkbox.
  In this list, only the first bytes for a unique identification must be specified, the others are not verified. The entry in the lists must be done into the „edit entry" field and then added with the „add" button.
  Also an entry in the list can be selected and then removed with the „del" button. The syntax of the entry is a two-digit hexadecimal representation of each byte, separated by a comma (,).
  A special meaning has the hexadecimal value „EE". It is a wildcard byte and represents any byte between „00" and „FF".

Example

In the above dialog picture, the filter items are not switched off. The telegrams sent by the units FCP, FDC and PC being addressed to the units FDC and PC will be shown. The include list is not enabled but the exclude list is enabled.
As it contains the telegram „3E,FF, 06", this telegram will be suppressed.

If the filter selection dialog is closed with the „OK" button, all adjustments will be stored to disk to make them available at the next startup of SDCMAINT. But if the dialog is left using the „Cancel" button, all changes of the adjustments will not be performed.

4.1.3 IMCS MENU ITEM „DISPLAY SELECT...“



This dialog window allows configuring the display options of the shown telegrams in the „iMCS Record new“ dialog. Here it is possible to add or remove some information in the displayed telegrams or to change the used output format. Additionally, the default store options are pre-settable and the editing of the iMCS data abbreviation database is provided.

Display options:

- „**decoded addresses**“
  If this option is selected, the source and destination units will be displayed by their names *(Example: „SPC > ASC“)*. If it is not selected, the source and destination units will be displayed by their iMCS Ethernet addresses *(Example: „00-07-00-1f-bb-00 -> 01-00-04-1f-bb-00“)*.

- „**decoded messages**“
  If this option is selected, the user-defined telegram prefix is decoded as „UserDef:“ and the system messages are displayed in a readable ASCII representation. If it is not selected, all telegrams will be displayed in hexadecimal format.

- „**decoded iMCS data**“
  If this option is selected, additionally to „decoded messages“ all the telegrams to be displayed are compared with an abbreviation database where any telegram can be stored together with a corresponding abbreviation word.

If an abbreviation is found, it will be displayed instead of the hexadecimal code. Also the display selection dialog is enlarged with an „iMCS data abbreviation" editor group.
These controls allow to list and edit the abbreviation database. There are an edit field to type a new abbreviation and controls to add, remove and replace an entry. About 150 entries are the standard set of abbreviations in the database. The actual number is shown in the headline of the editor group. All entries are stored into the configuration file ABBR_RX.INI in the SDCMAINT home directory.

- „**length of telegrams**"
  If this option is selected, the length of each telegram is displayed between the address field and data field of the shown telegram. The format is decimal. *(Example: „078byte")*

- „**differential time**"
  If this option is selected, the time difference between the previously received *telegram* and the actual telegram is displayed in front of the address field in a decimal millisecond representation. The resolution depends on the PC's operating system and is 55 ms under Windows3.x and 14 ms under Windows95. *(Example: „1867ms")*

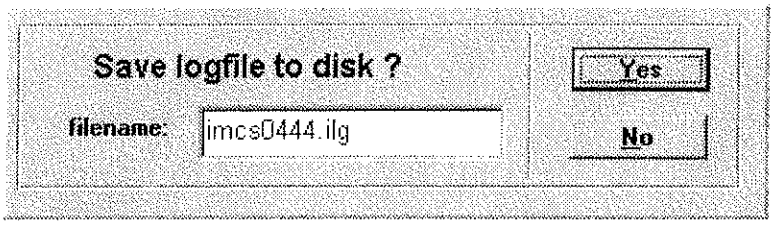
- „**line no. counter**"
  If this option is selected at the beginning of each line, a four-digit line counter value is displayed with the received telegram. It will be helpful to find a special line when looking for it in the log file later on. *(Example: „3091.")*

- „**cut end of telegrams**"
  If this option is selected, display of the hexadecimal telegram data is cut at the 84th position. This is helpful if many long telegrams are received and the contents of the data field are not necessary for analyzing the iMCS traffic.
  Thus, the amount of telegrams displayed in the list until writing to hard disk becomes necessary, will be increased. This is because only up to 65000 characters can be displayed in the list window at once.

- „**ms Refresh**"
  This entry field allows to set the refresh rate of the iMCS record window. The default value is 200 ms. A value of 0 ms forces to update the display with every received telegram. This operation forces a higher CPU load.

Store options

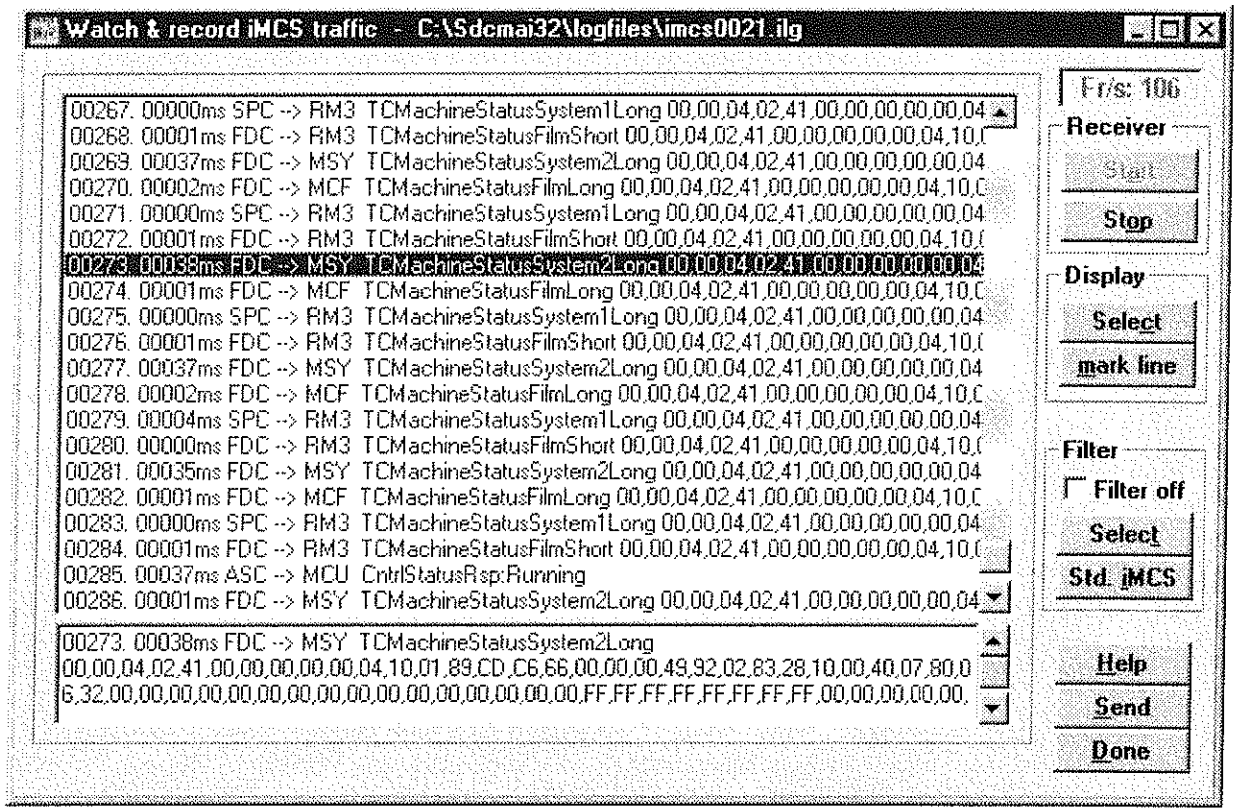
In this selection group, you can select the default store option on closing the „iMCS Record new" dialog: You can select either to always store the list into the log file with the default name „IMCSnnnn.ILG" where nnnn is a 4-digit counter. Or you can select to never store the list.
Then the temporary log file will be deleted on closing. The third selection is to be requested every time on closing the dialog why you want to save the logfile into the LOGFILE subdirectory. You get the following dialog window:



The standard logfile name „IMCSnnnn.ILG" is suggested as default name but can be changed into any other meaningful filename. Please keep the default extension „ILG" since it is used as a filter when opening a logfile.

Now push the „OK" button to exit the display selection dialog with storing the actual options to hard disk. If you want to keep the previous options settings, push the „Cancel" button.

4.1.4 IMCS MENU ITEM „RECORD NEW..."

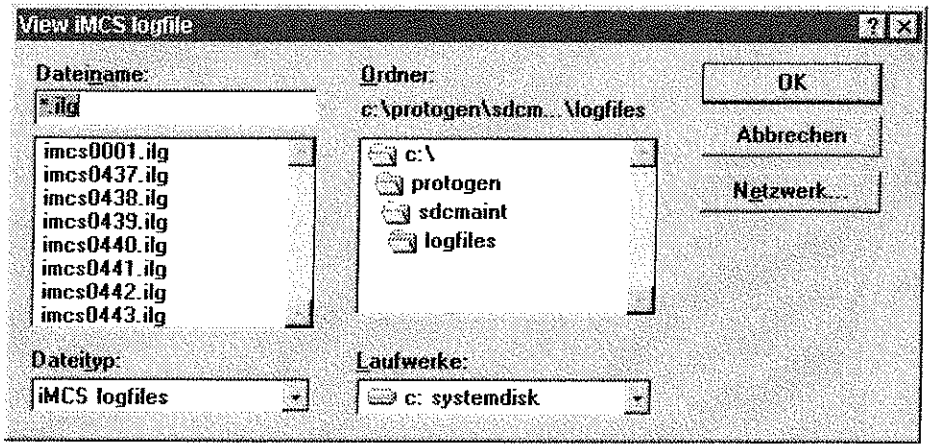

Watch & record iMCS traffic - C:\Sdcmai32\logfiles\imcs0021.ilg
00267. 00000ms SPC --> RM3 TCMachineStatusSystem1Long 00,00,04,02,41,00,00,00,00,00,04
00268. 00001ms FDC --> RM3 TCMachineStatusFilmShort 00,00,04,02,41,00,00,00,00,00,04,10,(
00269. 00037ms FDC --> MSY TCMachineStatusSystem2Long 00,00,04,02,41,00,00,00,00,00,04
00270. 00002ms FDC --> MCF TCMachineStatusFilmLong 00,00,04,02,41,00,00,00,00,00,04,10,(
00271. 00000ms SPC --> RM3 TCMachineStatusSystem1Long 00,00,04,02,41,00,00,00,00,00,04
00272. 00001ms FDC --> RM3 TCMachineStatusFilmShort 00,00,04,02,41,00,00,00,00,00,04,10,(
00273. 00038ms FDC --> MSY TCMachineStatusSystem2Long 00,00,04,02,41,00,00,00,00,00,04
00274. 00001ms FDC --> MCF TCMachineStatusFilmLong 00,00,04,02,41,00,00,00,00,00,04,10,(
00275. 00000ms SPC --> RM3 TCMachineStatusSystem1Long 00,00,04,02,41,00,00,00,00,00,04
00276. 00001ms FDC --> RM3 TCMachineStatusFilmShort 00,00,04,02,41,00,00,00,00,00,04,10,(
00277. 00037ms FDC --> MSY TCMachineStatusSystem2Long 00,00,04,02,41,00,00,00,00,00,04
00278. 00002ms FDC --> MCF TCMachineStatusFilmLong 00,00,04,02,41,00,00,00,00,00,04,10,(
00279. 00004ms SPC --> RM3 TCMachineStatusSystem1Long 00,00,04,02,41,00,00,00,00,00,04
00280. 00000ms FDC --> RM3 TCMachineStatusFilmShort 00,00,04,02,41,00,00,00,00,00,04,10,(
00281. 00035ms FDC --> MSY TCMachineStatusSystem2Long 00,00,04,02,41,00,00,00,00,00,04
00282. 00001ms FDC --> MCF TCMachineStatusFilmLong 00,00,04,02,41,00,00,00,00,00,04,10,(
00283. 00000ms SPC --> RM3 TCMachineStatusSystem1Long 00,00,04,02,41,00,00,00,00,00,04
00284. 00001ms FDC --> RM3 TCMachineStatusFilmShort 00,00,04,02,41,00,00,00,00,00,04,10,(
00285. 00037ms ASC --> MCU CntrlStatusRsp:Running
00286. 00001ms FDC --> MSY TCMachineStatusSystem2Long 00,00,04,02,41,00,00,00,00,00,04
00273. 00038ms FDC --> MSY TCMachineStatusSystem2Long
00,00,04,02,41,00,00,00,00,00,04,10,01,89,CD,C6,66,00,00,00,49,92,02,83,28,10,00,40,07,80,0
6,32,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,FF,FF,FF,FF,FF,FF,FF,FF,00,00,00,00,00,
Fr/s: 106
Receiver
Start
Stop
Display
Select
mark line
Filter
Filter off
Select
Std. iMCS
Help
Send
Done

This menu item provides a list window where all received telegrams will be shown, each telegram in a line. It is possible to select one of the lines by a single click.
Then a second window will appear beneath the list window and shows the selected telegram in full length. The automatic scrolling of the telegram list window is then stopped and the selected telegram stays visible in it.
Single-clicking the selected line once more, deselects it again. The second window disappears and the list window starts scrolling again showing always the latest telegrams received.

The size of this dialog can be modified by dragging the lower right corner of the dialog window. So, the size of the list window will be increased and more telegram data can be shown in a line or more lines can be displayed at once. This new size will be stored to disk for a next session. There are also several control buttons available:

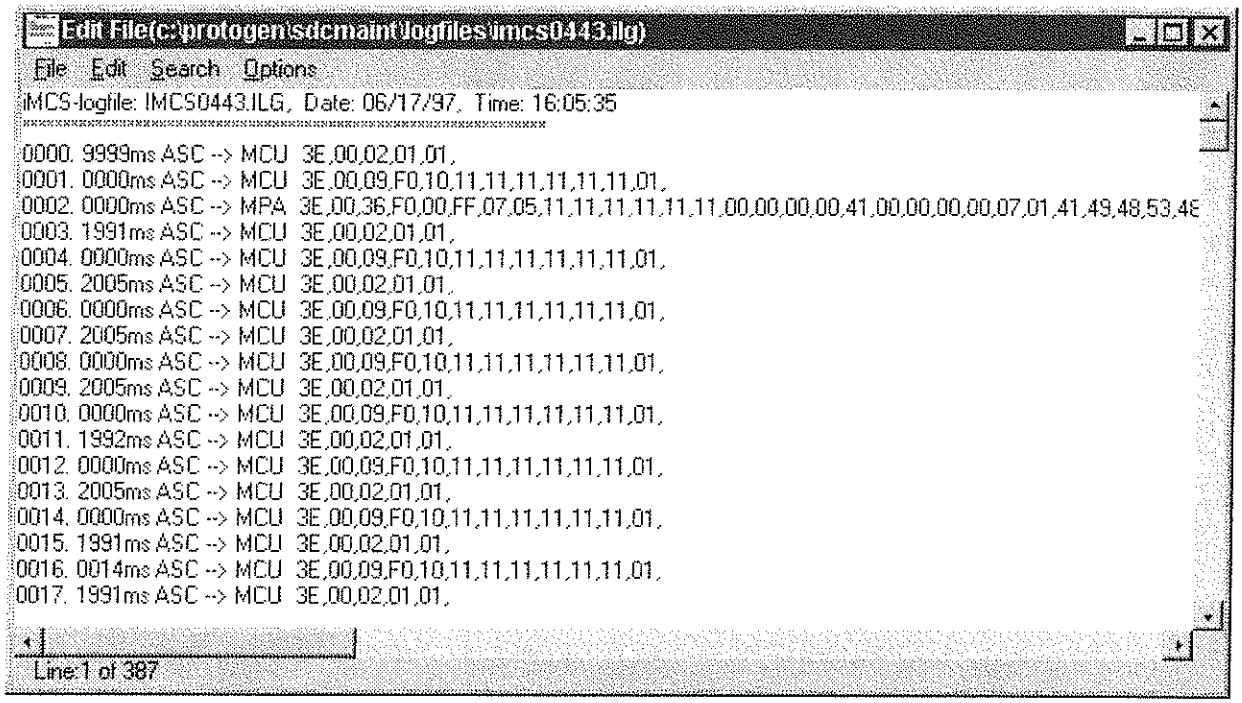
- The receiver can be started and stopped by pushing the „Start" or „Stop" button.
- The display format can be changed by pushing the „Display Select" button. Then the display selection dialog described in chapter 4.1.3 will be started.
- A marking line can be inserted into the list by pushing the button „mark line". This can help to find again an interesting position in the list for a later analysis. If a line in the list is selected, the mark line will be inserted before this line. If no line is selected, the mark line will be appended at the end of the list, that means at the actual time of which the receiver is started.
- A checkbox allows switching off or on the pre-configured telegram filter. If it is checked, the filter will be bypassed and all telegrams are displayed.
- A „Filter select" button allows starting the filter selection dialog described in chapter 4.1.2. There you may change the filter options online while the iMCS recorder is running.
- An "iMCS mode" button allows switching between "Std. iMCS" mode for the film scanners and "IEEE iMCS" mode for the Voodoo tape recorder.
- The „Send" button activates the Send iMCS message dialog where you can edit and send a single telegram into the iMCS network. These functions are described in chapter 4.1.8.
- The „Done" button finally closes the dialog. The contents of the list window is stored to disk or deleted according to the store options settings in the display select dialog.
- The upper right corner of the dialog contains a display field that shows the actual frame per second rate in the iMCS network. This value is independent of the filter settings and the receiver start/stop, but depends on the hardware receive mode described in chapter 3.12. It will be correct at the receive mode „all telegrams".

4.1.5 IMCS MENU ITEM „OPEN..."



The „iMCS Open" menu item allows opening a previously stored iMCS logfile with a built-in text editor. First, you get a file selection dialog with the default settings of the path to the LOGFILES subdirectory and the file extensions to *.ILG.
You may select a file shown in the list box or change the drive, the directory path or the file type.

After selecting a file and clicking the „OK" button or double-clicking the filename, the editor is started showing the contents of the selected logfile.



The first line of each logfile contains the filename and date and time at which recording of the logfile has started. The editor allows to view the logfile by scrolling through it or by searching for any keyword.
You may also edit the logfile and insert remarks for a later analysis. The standard edit functions **Undo, Cut, Copy, Paste, Clear** and **Select** are all available. You can write the changes using the **Write** and **Write as** items of the file pulldown menu. Then use **File - Exit** to terminate the editor dialog.

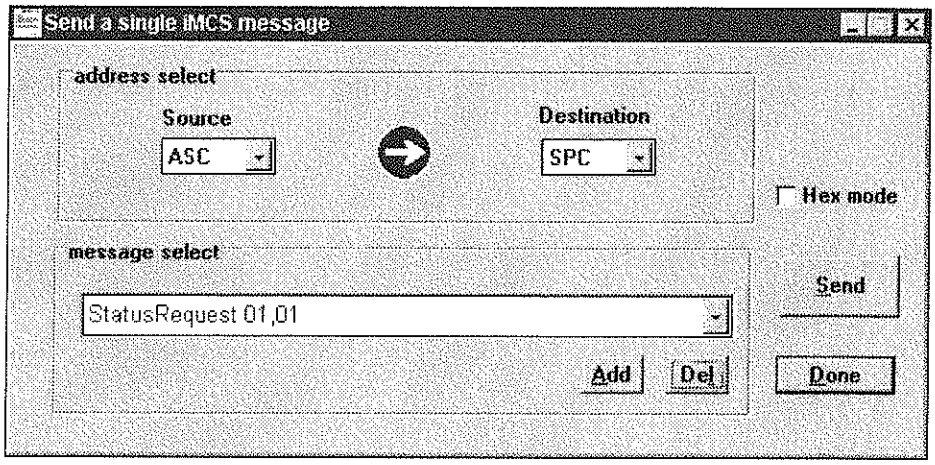
4.1.6 IMCS MENU ITEM „SAVE"

This menu item saves the current contents of the iMCS recorder list window to a logfile with the default name. However, the iMCS recorder will not be stopped or closed at this action.

4.1.7 IMCS MENU ITEM „SAVE AS..."

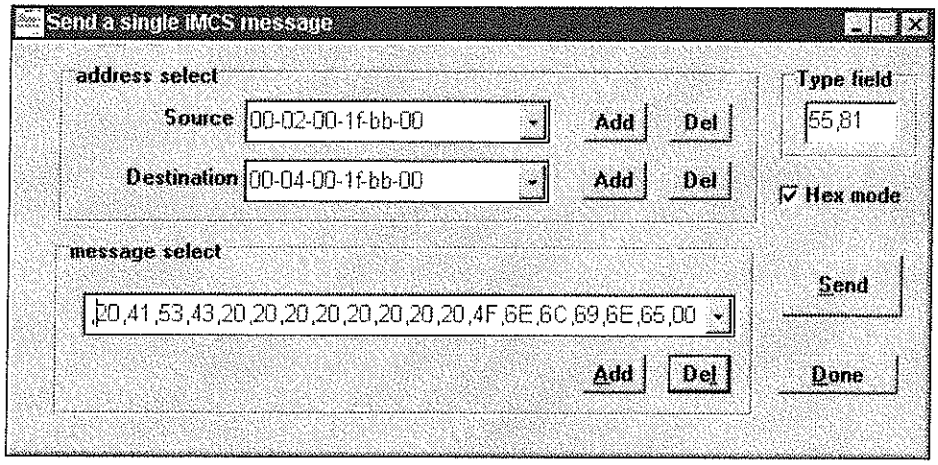
This menu item saves the current contents of the iMCS recorder list window to a logfile with a selectable filename. Therefore, a "file save dialog" is shown to allow entering a new filename. However, the iMCS recorder will not be stopped or closed at this action.

4.1.8 IMCS MENU ITEM „SEND..."



The menu item „iMCS Send" opens a dialog window that will be shown in two different representations. This depends on the „Hex mode" checkbox at the right side.

- **Non-Hex mode**
  If it is not checked, the desired source and the destination addresses can be selected from a pulldown list by their names.



- **Hex mode**
  If it is checked, the source and the destination address must be entered in the Ethernet address format. Newly entered addresses can be stored in a pulldown list for later use. Additionally, a „Type field" is displayed showing the default Ethernet type 55,81 reserved for iMCS 1 protocol. It may be changed here.

In both representations, the „Message select" field allows to enter a telegram in hexadecimal format or to select one of the previously added telegrams from the pulldown list. Each entry can be made up to 128 bytes long.
By pushing the „Add" button newly entered telegrams can be stored in the pulldown list for later use. A selected telegram in the list can be removed by pushing the „Del" button.

(Remark: This function is only available in Service mode!)

Only in the Non-Hex mode it is possible to add a description keyword at the beginning of the message, separated from the hexadecimal telegram contents by a space character.
The so selected telegram code is sent to the destination unit every time the „Send" button is pushed. In the Non-Hex mode, a spark sign is shown in the upper right corner during sending. The dialog can be closed using the „Done" button.

4.1.9 IMCS MENU ITEM „PRINT..."

This iMCS menu item allows to start printing the current active iMCS logfile to the default system printer of Windows.

4.1.10 IMCS MENU ITEM „PRINT SETUP..."

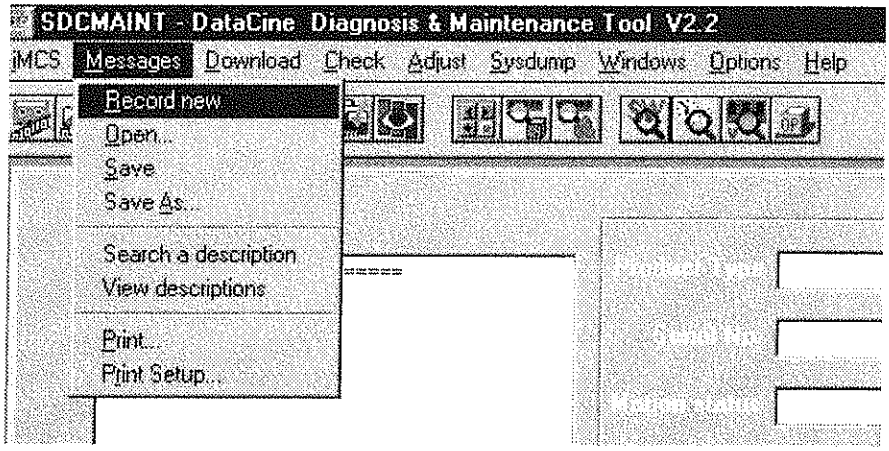
This iMCS menu item activates the Windows' printer setup dialog where you can select one of the installed printers and change their printer options.

4.1.11 IMCS MENU ITEM „EXIT"

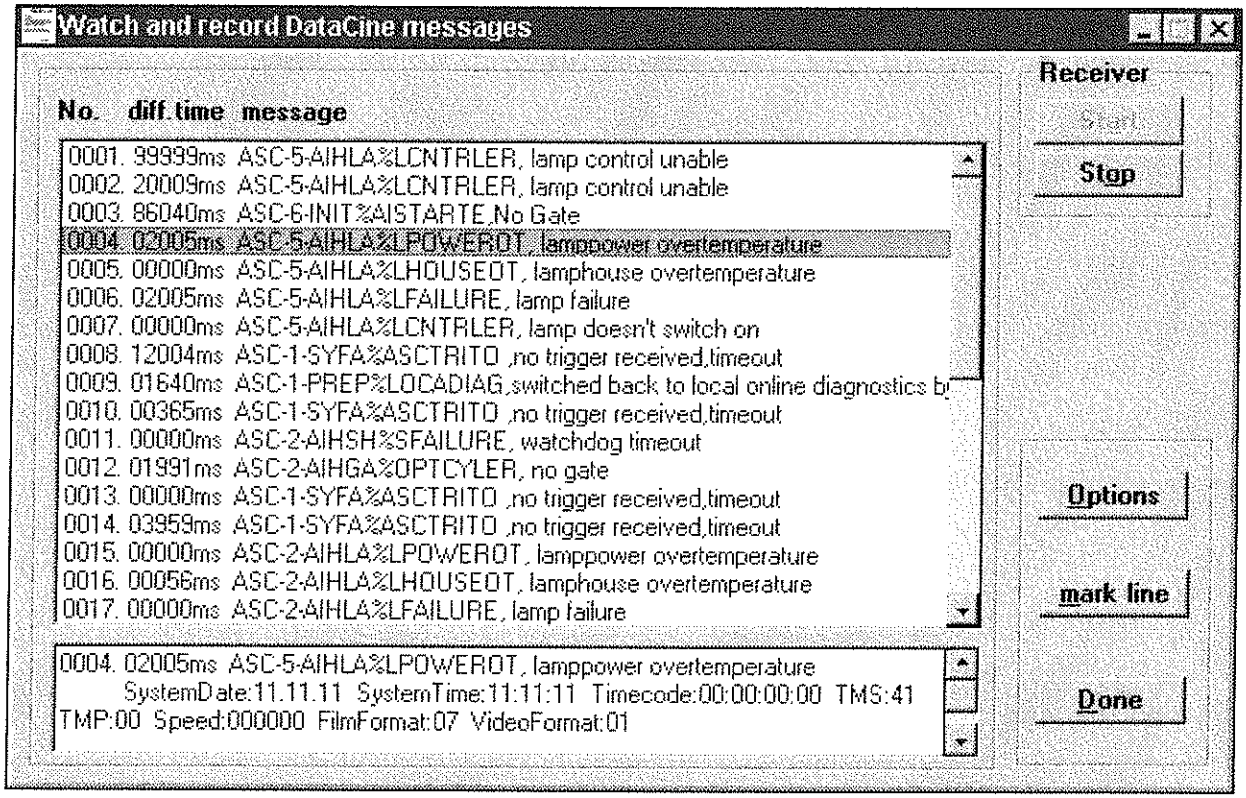
This is the main exit of the SDCMAINT diagnosis and maintenance tool. All the actual settings of the dialogs are stored to disk and the application is terminated.

4.2 PULLDOWN MENU „MESSAGES"

The pulldown menu Messages contains all menu items that concern the watching and recording of system messages on the SDC 2000 iMCS network. These system messages are special telegrams that are sent by the units which have detected a predefined system condition. This can be an informal message as well as a fatal system error. There are many menu items available to support this task.



4.2.1 MESSAGES MENU ITEM „RECORD NEW..."


Watch and record DataCine messages
No. diff.time message
0001. 99999ms ASC-5-AIHLA%LCNTRLER, lamp control unable
0002. 20009ms ASC-5-AIHLA%LCNTRLER, lamp control unable
0003. 86040ms ASC-6-INIT%AISTARTE,No Gate
0004. 02005ms ASC-5-AIHLA%LPOWEROT, lamppower overtemperature
0005. 00000ms ASC-5-AIHLA%LHOUSEOT, lamphouse overtemperature
0006. 02005ms ASC-5-AIHLA%LFAILURE, lamp failure
0007. 00000ms ASC-5-AIHLA%LCNTRLER, lamp doesn't switch on
0008. 12004ms ASC-1-SYFA%ASCTRITO ,no trigger received,timeout
0009. 01640ms ASC-1-PREP%LOCADIAG,switched back to local online diagnostics b
0010. 00365ms ASC-1-SYFA%ASCTRITO ,no trigger received,timeout
0011. 00000ms ASC-2-AIHSH%SFAILURE, watchdog timeout
0012. 01991ms ASC-2-AIHGA%OPTCYLER, no gate
0013. 00000ms ASC-1-SYFA%ASCTRITO ,no trigger received,timeout
0014. 03959ms ASC-1-SYFA%ASCTRITO ,no trigger received,timeout
0015. 00000ms ASC-2-AIHLA%LPOWEROT, lamppower overtemperature
0016. 00056ms ASC-2-AIHLA%LHOUSEOT, lamphouse overtemperature
0017. 00000ms ASC-2-AIHLA%LFAILURE, lamp failure
0004. 02005ms ASC-5-AIHLA%LPOWEROT, lamppower overtemperature
SystemDate:11.11.11 SystemTime:11:11:11 Timecode:00:00:00:00 TMS:41
TMP:00 Speed:000000 FilmFormat:07 VideoFormat:01
Receiver
Start
Stop
Options
mark line
Done

This menu item provides a list window where all received system messages will be shown, each message in a single line. It is possible to select one of the lines by a single click. Then the second window beneath the list window shows the system message in full length. The automatic scrolling of the message list window is then stopped and the selected message stays visible in it.
Clicking the selected line once more deselects it again. Then the second window is cleared and the list window starts scrolling again, showing always the latest message at the end.

A message line contains six elements:

1) **No.**
   At the first position, a four-digit number counting from 0000 upwards.

2) **diff. time**
   At the second position, a five-digit differential time value is displayed in milliseconds. It is the time between the previously and the actually received message. The resolution depends on the PC's operating system and is 55 ms under Windows3.x and 14 ms under Windows95.

3) **message**
   At the third position starts the decoded system message showing the name of the unit which sent the system message.

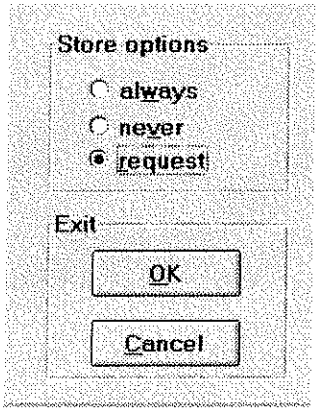
4) Next is the weighting of the message between 1 (= informal) and 6 (= fatal error).

5) Then a shortcut of the system message is displayed in the format <module name>%<msg name>.

6) The last element is a short description of the meaning of the system message.

There are also some control buttons available at the right side:

- The receiver can be started and stopped by pushing the „Start" or „Stop" button.
- The store options can be changed by pushing the „Options" button. In the pop up dialog, you can select the default store option on closing the „Messages new record" dialog: you can select either to always store the list into the logfile with the default name „MSGSnnnn.MLG" where nnnn is a 4-digit counter, or you can select to never store the list.

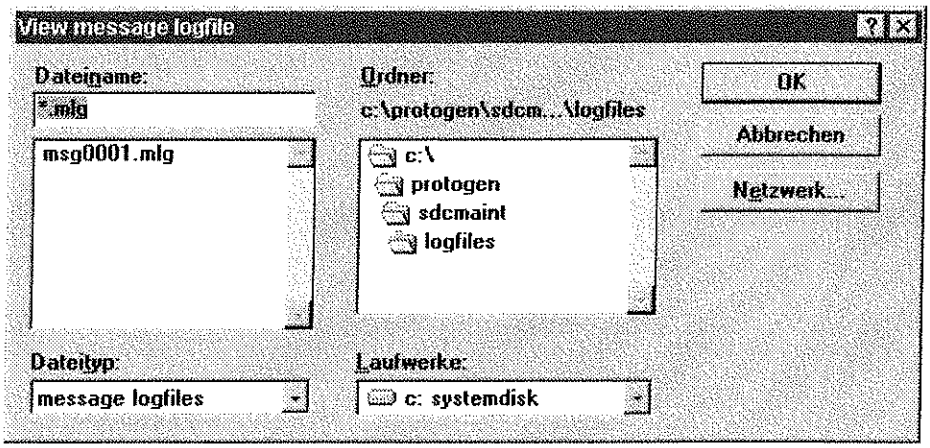


Then the temporary logfile will be deleted on closing. The third selection is to be requested every time on closing the dialog why you want to save the logfile into the LOGFILE subdirectory.

The standard logfile name „MSGSnnnn.MLG" is suggested as a default name, but can be changed to any other meaningful filename. Please keep the default extension „MLG" since it is used as a filter when opening a logfile.

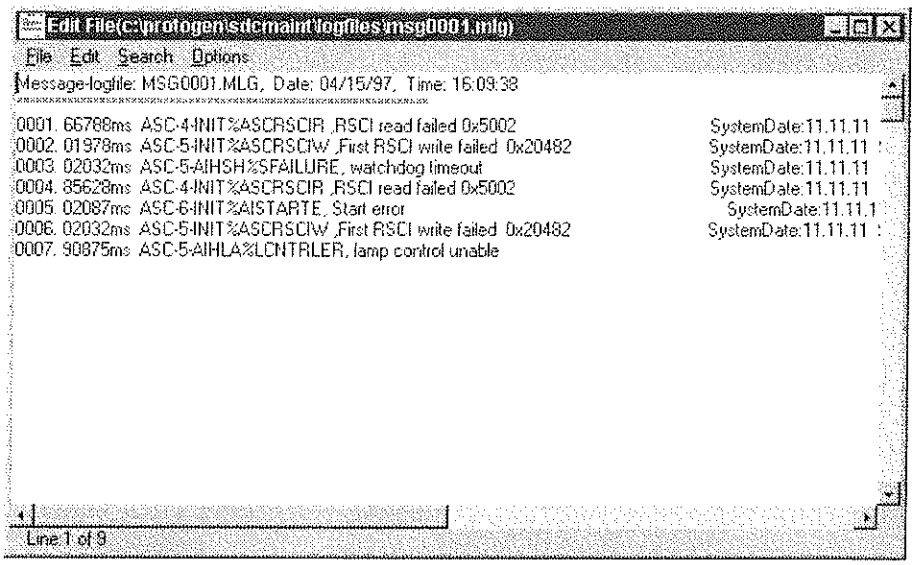
- A marking line can be inserted into the list by pushing the button „mark line". This can help to find again an interesting position in the list for a later analysis. If a line in the list is selected, the mark line will be inserted before this line. If no line is selected, the mark line will be appended at the end of the list, that means at the actual time at which the receiver is started.
- The „Done" button finally closes the dialog. The contents of the list window is stored to disk or deleted according to the store option settings in the Options select dialog.

4.2.2 MESSAGES MENU ITEM „OPEN..."



The „Messages Open" menu item allows to open a previously stored message logfile with a built-in text editor.

First, you get a file selection dialog with the default settings of the path to the LOGFILES subdirectory and the file extensions to *.MLG. You may select a file shown in the list box or change the drive, the directory path or the file type.
After selecting a file and clicking the „OK" button or double-clicking the filename, the editor is started showing the contents of the selected logfile.


Edit File(c:\protogen\stc\maint\logfiles\msg0001.mlg)
File Edit Search Options
Message-logfile: MSG0001.MLG, Date: 04/15/97, Time: 16:09:38
0001. 66788ms ASC-4-INIT%ASCRSCIR ,RSCI read failed 0x5002 SystemDate:11.11.11
0002. 01978ms ASC-5-INIT%ASCRSCIW ,First RSCI write failed 0x20482 SystemDate:11.11.11
0003. 02032ms ASC-5-AIHSH%SFAILURE, watchdog timeout SystemDate:11.11.11
0004. 85628ms ASC-4-INIT%ASCRSCIR ,RSCI read failed 0x5002 SystemDate:11.11.11
0005. 02087ms ASC-6-INIT%AISTARTE, Start error SystemDate:11.11.1
0006. 02032ms ASC-5-INIT%ASCRSCIW ,First RSCI write failed 0x20482 SystemDate:11.11.11
0007. 90875ms ASC-5-AIHLA%LCNTRLER, lamp control unable
Line 1 of 9

The first line of each logfile contains the filename and the date and time at which the recording of the logfile has started. The editor allows to view the logfile by scrolling through it or by searching for any keyword. You may also edit the logfile and insert remarks for a later analysis. The standard edit functions **Undo, Cut, Copy, Paste, Clear and Select** are all available. You can write the changes using the „Write" and „Write as" items of the File pulldown menu. Then use File Exit to terminate the editor dialog.

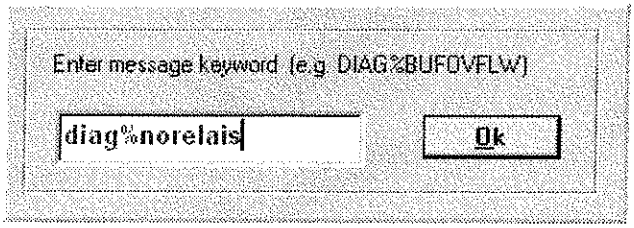
4.2.3 MESSAGES MENU ITEM „SAVE"

This menu item saves the current contents of the Messages recorder list window to a logfile with the default name. However, the Messages recorder will not be stopped or closed at this action.

4.2.4 MESSAGES MENU ITEM „SAVE AS..."

This menu item saves the current contents of the Messages recorder list window to a logfile with a selectable filename. Therefore, a file save dialog is shown to allow entering a new filename. However, the Messages recorder will not be stopped or closed at this action.

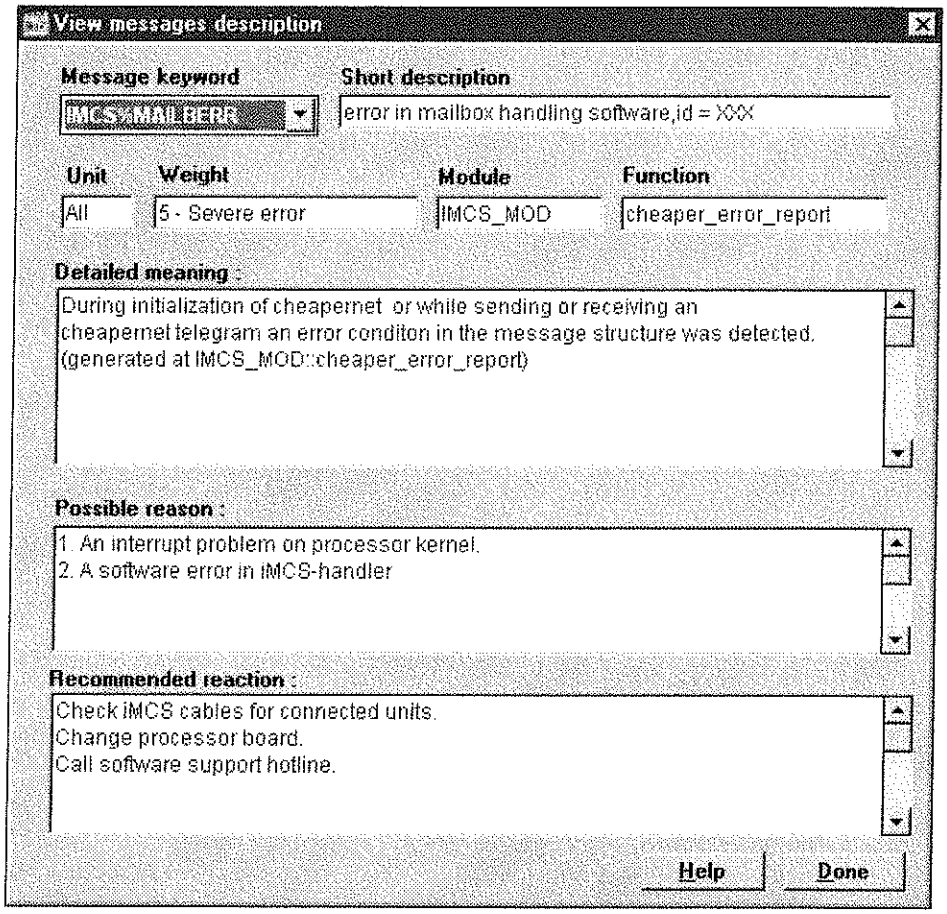
4.2.5 MESSAGES MENU ITEM „SEARCH A DESCRIPTION"



In this dialog you can enter a message keyword like the example above or only the beginning part of it.
After pressing <RETURN> or clicking [Ok] the message description dialog is started. It gets a more detailed description of this system message from a database and displays the results (see the example in chapter 4.2.6.)

Messages Menu item „view a description"

This dialog allows to select a system message keyword from a dropdown list. Then a more detailed description of this system message is fetched from an external database and displayed in some text boxes:



If there are longer descriptions in the textboxes "Detailed meaning", "Possible reason" and "Recommended reaction", you can scroll through them with the scrollbars at the right side.
You also can select another keyword using the "Message keyword" dropdown list.
To close the dialog, click the "Done" button.

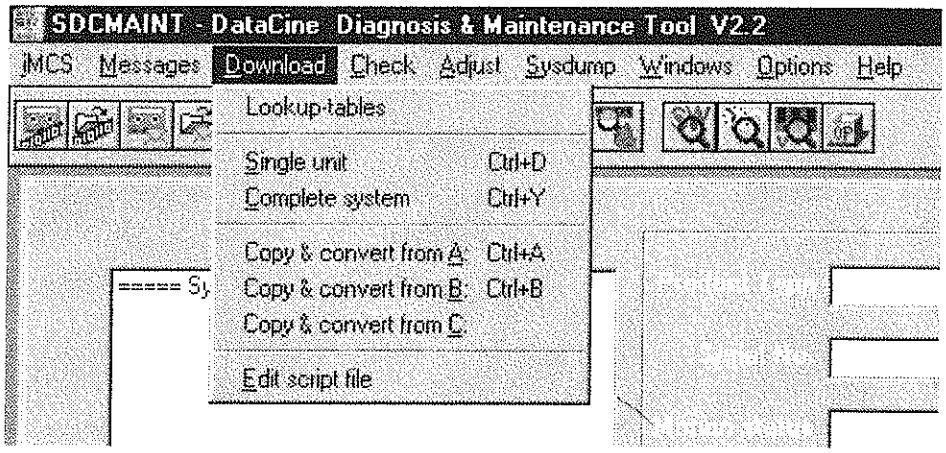
4.2.6 MESSAGES MENU ITEM „PRINT..."

This Messages menu item allows to start printing the currently by active Messages logfile to the default system printer of Windows.

4.2.7 MESSAGES MENU ITEM „PRINT SETUP...“

This Messages menu item activates the Windows' printer setup dialog. There you can select one of the installed printers and change their printer options.

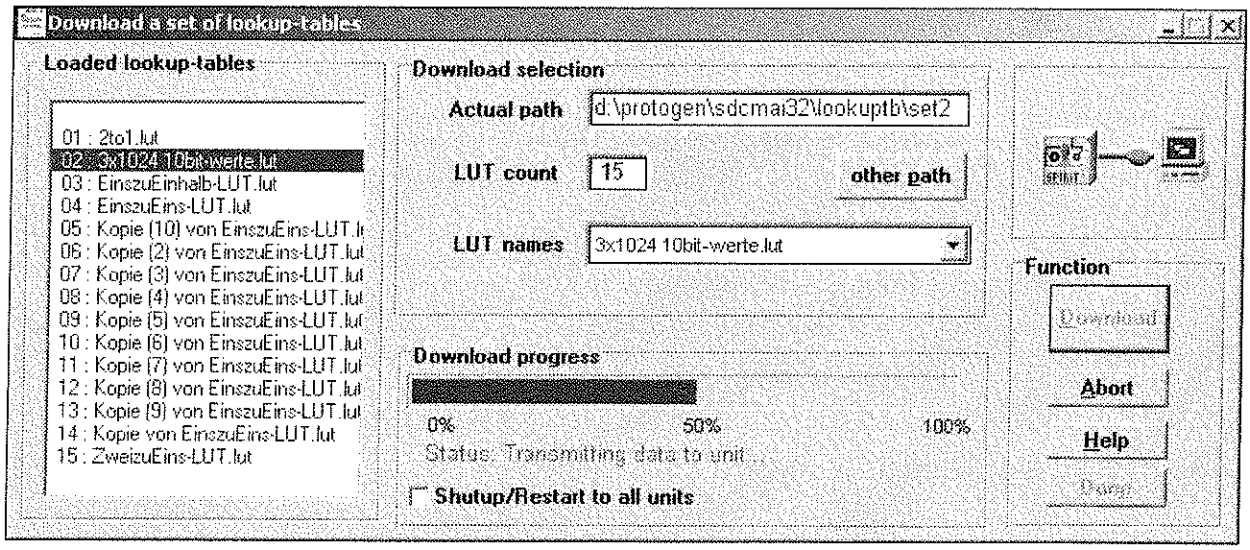
4.3 PULLDOWN MENU „DOWNLOAD“


SDCMAINT - DataCine Diagnosis & Maintenance Tool V2.2
IMCS Messages Download Check Adjust Sysdump Windows Options Help
Lookup-tables
Single unit Ctrl+D
Complete system Ctrl+Y
Copy & convert from A: Ctrl+A
Copy & convert from B: Ctrl+B
Copy & convert from C:
Edit script file

The pulldown menu Download contains all menu items that concern downloading data output lookup tables and new operation software to the film scanner. These items are “Lookup tables”, „Single unit“, „Complete system“, „Copy & convert from A:“, „Copy & convert from B:“ and „Edit script file“.

(Remark: The software download functions are only available in Service mode!)

4.3.1 DOWNLOAD MENU ITEM „LOOKUP TABLES“



This dialog window allows downloading of up to 15 lookup tables for data output to the DataCine film scanner. You can specify a path where a set of lookup tables is available for download.

Steps to perform a lookup table download:

4.3.1.1 GENERATE ONE OR MORE LOOKUP-TABLES IN ASCII TEXT FORMAT.

The lookup-tables must be generated in a pre-defined text format. This can be done either using a standard ASCII text editor or using a standard spreadsheet application like Microsoft Excel®.

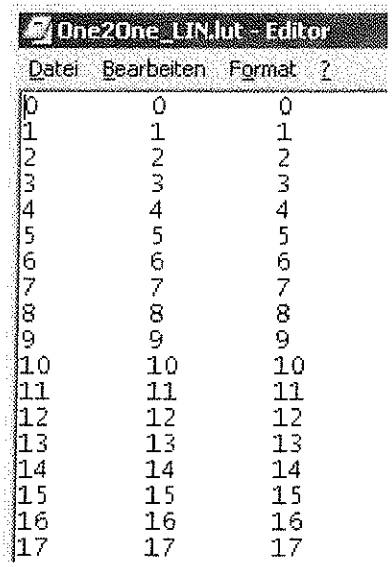
4.3.1.1.1 Using a text editor

Open a new text document and enter the decimal values for the red, green and blue channel in the following format:

[0...1023][TAB] [0...1023][TAB] [0...1023][CR][LF]
[0...1023][TAB] [0...1023][TAB] [0...1023][CR][LF]
[0...1023][TAB] [0...1023][TAB] [0...1023][CR][LF]
.....(1024times)

The table is built of 1024 lines and 3 columns where each entry consists of a decimal number between 0 and 1023 (any 10 Bit value). The three columns represent the red, green and blue color value and line 0...1023 the digital input value.

The name of the text-file is also pre-defined, as it should be displayed in the LUT-select-menu of the FCP. It should be up to 32 Byte long with a 3 Byte code at the end of the name and a fix suffix ".LUT".
The format is: [name]_[code].LUT where [code] is "LIN", "LOG" or "CRT" to mark the lookup-tables for linear, logarithmic or cathode ray tube specific coding. These codes are used to switch parameters of the primary color correction logic.
The code "VGA" is reserved for VGA monitoring lookup-tables.
Example:

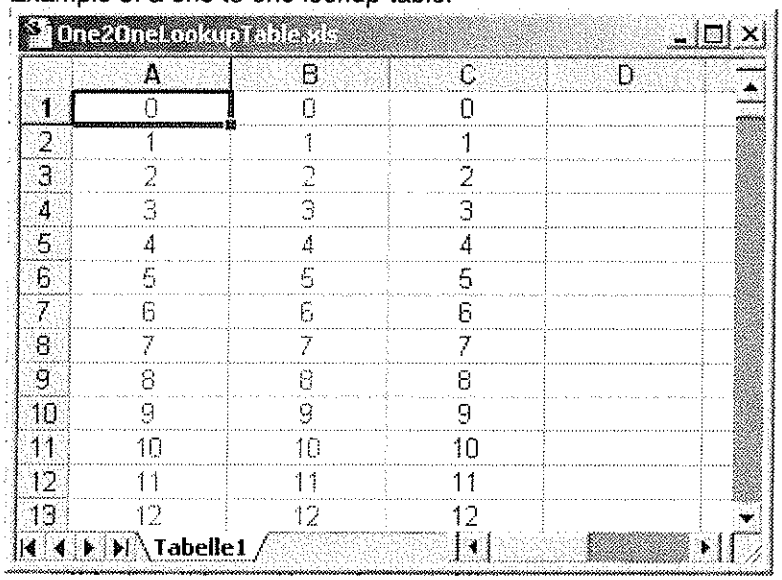


4.3.1.1.2 Using Microsoft Excel®

Start the spreadsheet application Excel® and open a new empty single sheet. Then fill the three columns A, B and C with numbers from 0 to 1023. Do this from row 1 to row 1024. Therefore you can use the automatic increment copy

features or a special mathematics formula supported by Excel®. To get the text file format from it, export the sheet using the pulldown menu "Store file as" and a file-type of "text with tabs". As Excel® automatically appends the extension ".txt" you have to rename the file extension to ".lut" regarding the naming conventions described in the above chapter.

Example of a one to one lookup-table:



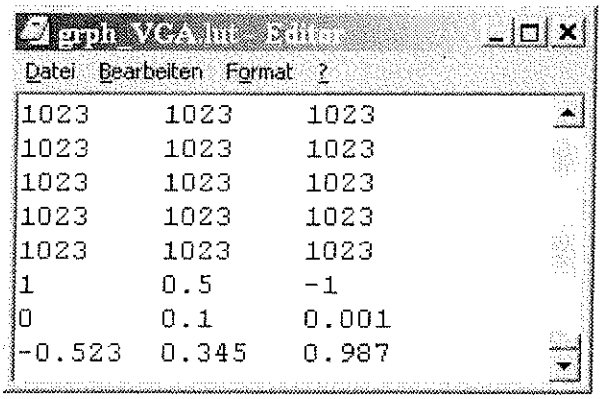
4.3.1.2 APPEND A MASKING MATRIX

If you intend to use the created lookup-table as a VGA-LUT (this means as a lookup-table for the GSN Preview monitoring output) you may append three lines, each with three decimal values between -1.999 and 1.999. These values represent the RGB masking matrix that should be used with this lookup-table.

If no matrix values are appended, default the unity matrix is used.

(1.000 0.000 0.000
0.000 1.000 0.000
0.000 0.000 1.000 = unity matrix)

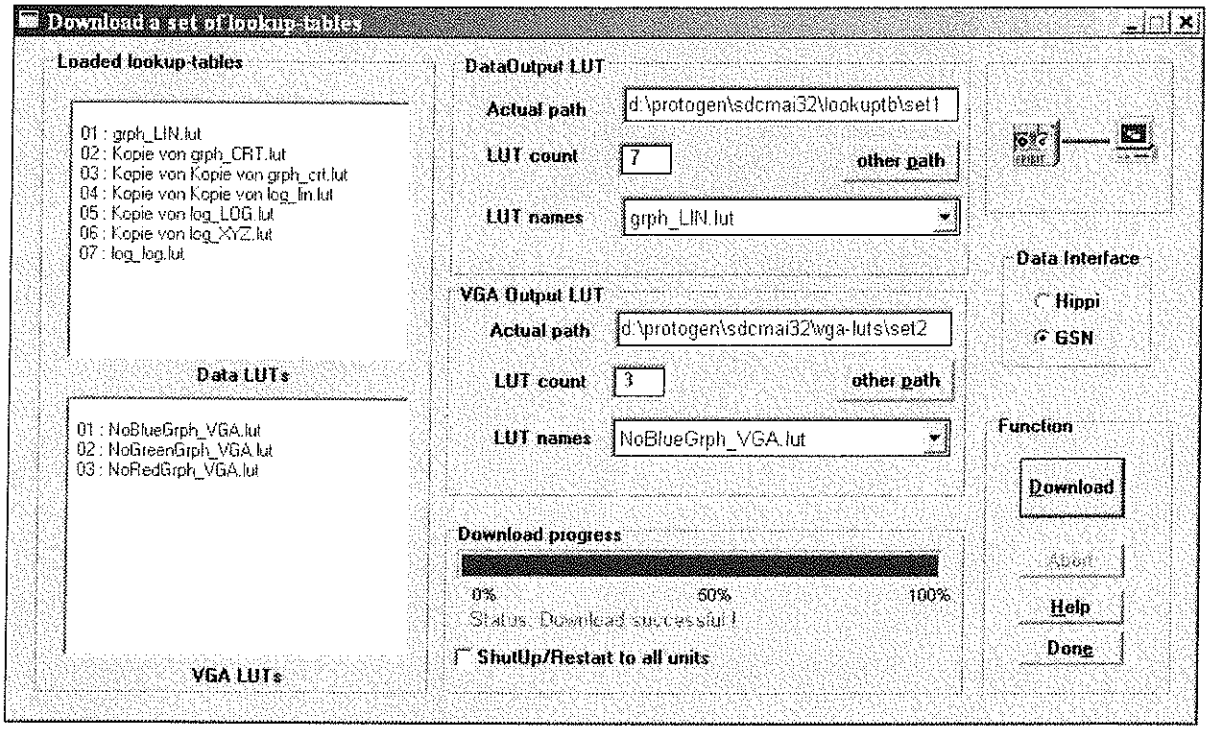
Example:

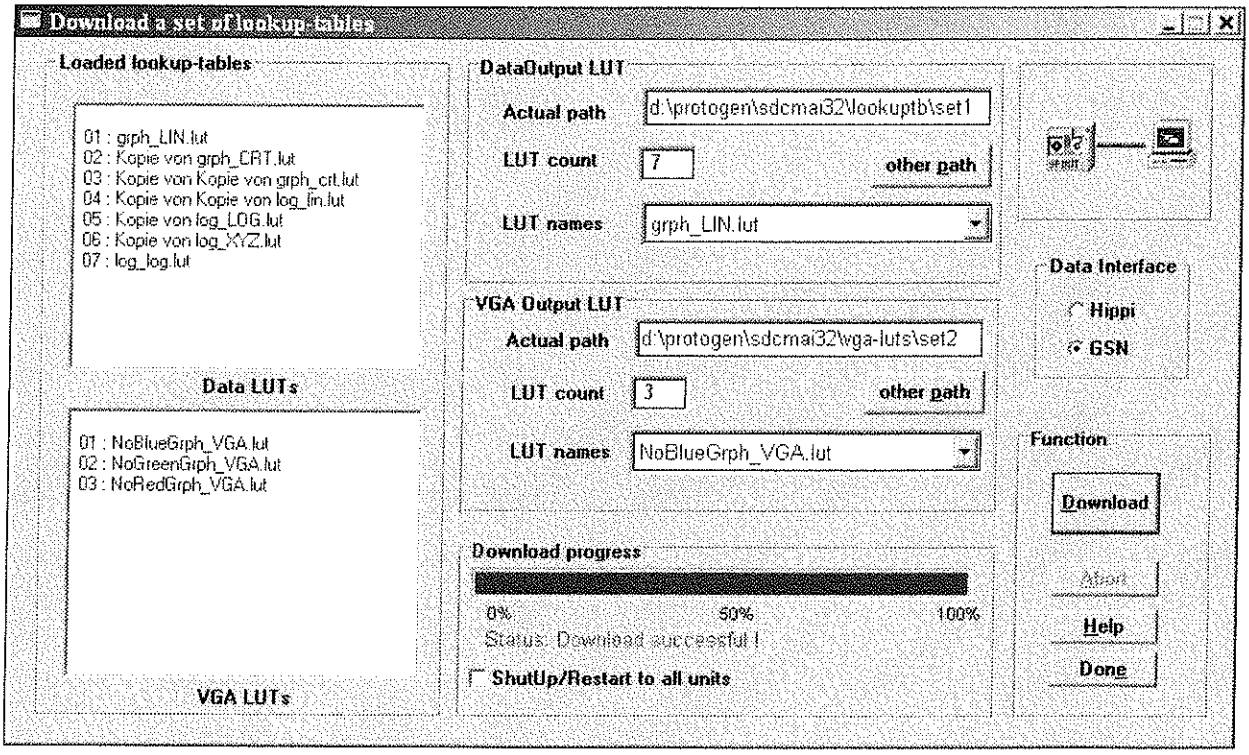


4.3.1.3 COPY THESE LOOKUP-TABLE FILES INTO A SPECIFIC WINDOWS® FOLDER

When you have created one or more lookup-tables as described above, copy them into a common folder or directory of your Diagnosis-PC. One therefore provided folder is the SDCMaint subfolder „LOOKUPTB\SET2“

4.3.1.4 USE SDCMAINT TO DOWNLOAD THE LOOKUP-TABLES TO YOUR FILM SCANNER





In the dialog window „Download a set of lookup-tables" you can see the list of the actually loaded lookup-tables in the connected film scanner.
First check the "Actual path". If it is not the one where you stored your new lookup-tables, push the button "other path". There you can select the correct path.
Then check the correct number and names of the lookup-tables and if all is ok, start the download by pushing the "Download" button.
When the download progress bar has reached the 100% mark it will last some seconds until the new list of loaded lookup-tables is shown on the left side of the dialog window.

In special environments, e.g. if the network is overloaded, the download may abort with an error message. In this case you can select the checkbox "Shut up/Restart" which stops all units prior to download and restarts them after download. After such a download, a new FPN sequence is necessary.

If there are more than 15 lookup-tables in the selected folder, only the first fifteen in alphabetic order will be downloaded. In this case a warning message is shown.

You will get an error message popup window when there is detected any format failure in one of the lookup-tables.

So if the number of lines is not 1024 or the number of TABs in each line is not 2, or if the decimal values are not in the range 0...1023 a corresponding message box reports the failed lookup-table name and the line No. where the error was detected.

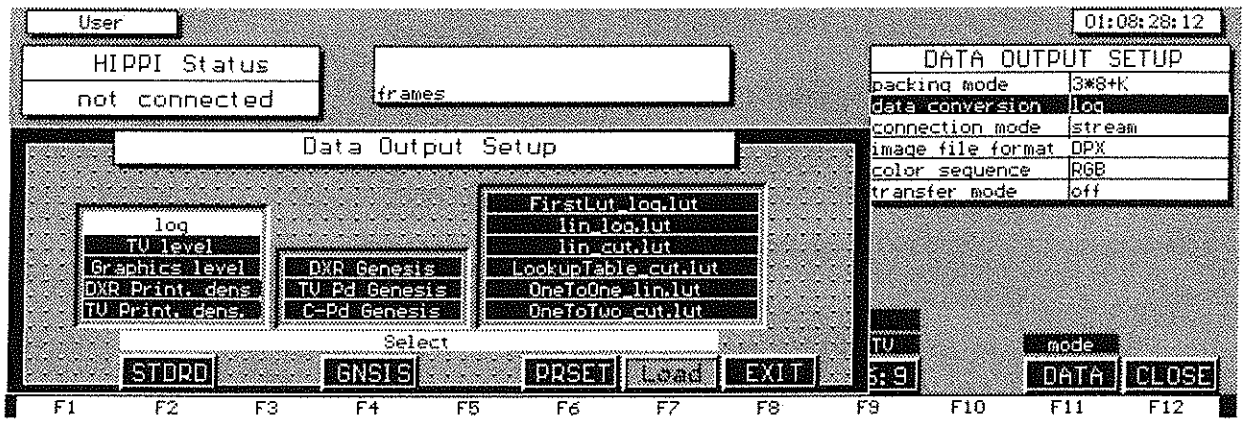
In case this download is not successfully there is an optionally 'Shut up/Restart to all units' (secure download). Select 'Restart/Restart to all units' (see figure above) and the LUT download will be handled like a SW download, with the disadvantage that the Spirit, Shadow or Specter will get a restart command after successful download.

Note!
It is recommended to activate the control "Shut up / Restart to all units" for the Virtual DataCine Specter VDC 2000 during LUT download.

4.3.1.5 SELECTION OF DOWNLOADED DATA OUTPUT LOOKUP-TABLES

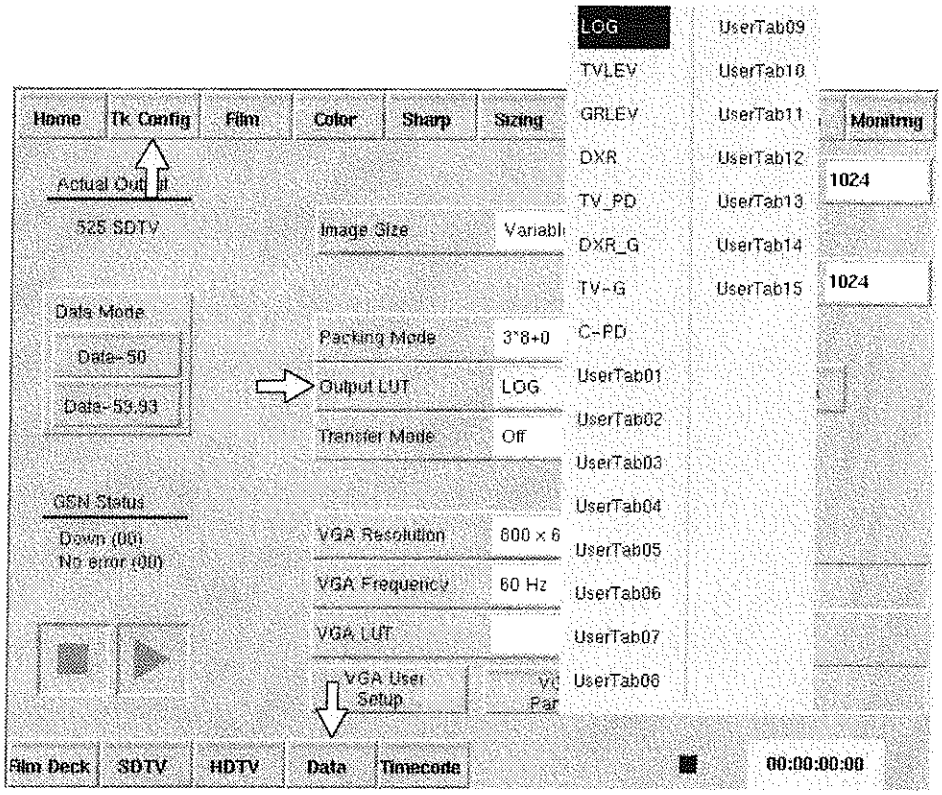
Functional Control Panel FCP

To activate one of the just downloaded lookup-tables at the Data Output Port, you have to select one of it using the Function Control Panel FCP. Go to menu "User – Setup – Data output setup" and select one of the listed lookup-tables.



Graphical Control Panel GCP

To activate one of the just downloaded lookup-tables at the Data Output Port, you have to select one of it using the Graphical Control Panel GCP. Go to menu.
"TK Config - Data - Output LUT" and select one of the listed lookup-tables. Please look at the example.



4.3.1.6 SELECTION OF DOWNLOADED VGA LOOKUP TABLES

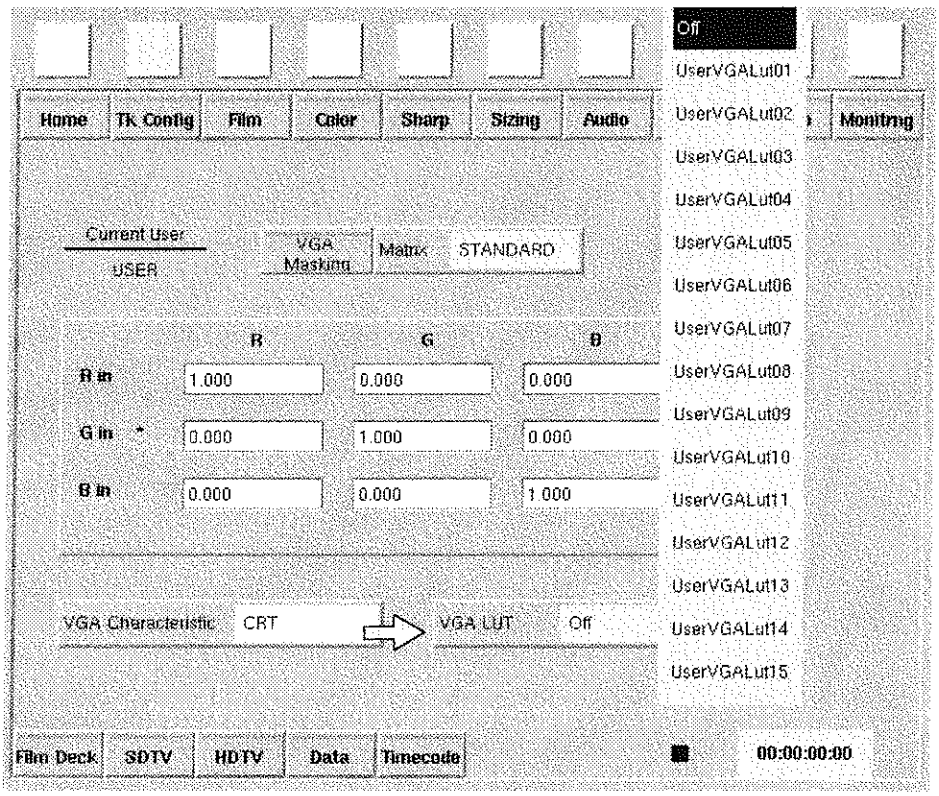
Only Graphical Control Panel GCP

To activate one of the just downloaded lookup-tables at the VGA Preview Port, you have to select one of it using the Graphical Control Panel GCP.
Go to menu "TK Config - Submenu Data,

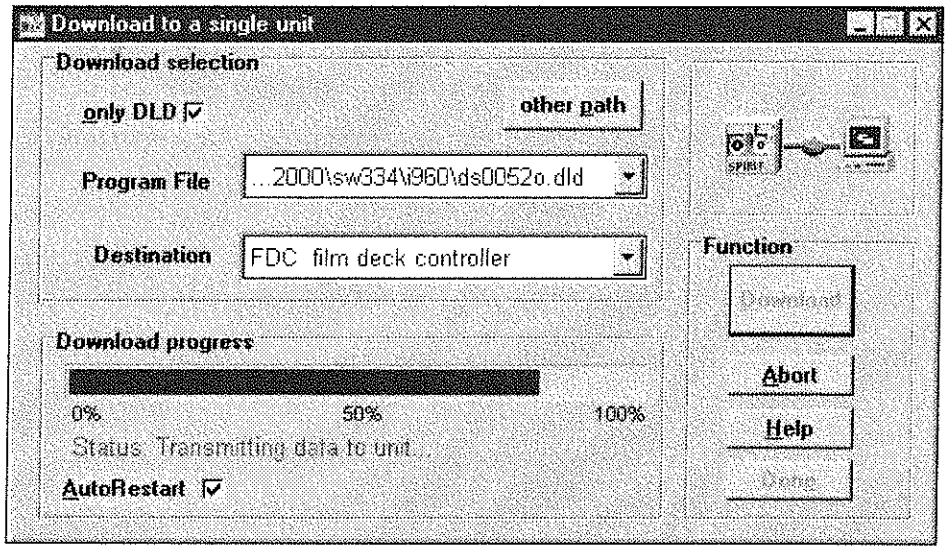
press VGA User Setup and VGA LUT"

and select one of the listed lookup-tables.

Please look at the example.



4.3.2 DOWNLOAD MENU ITEM „SINGLE UNIT“



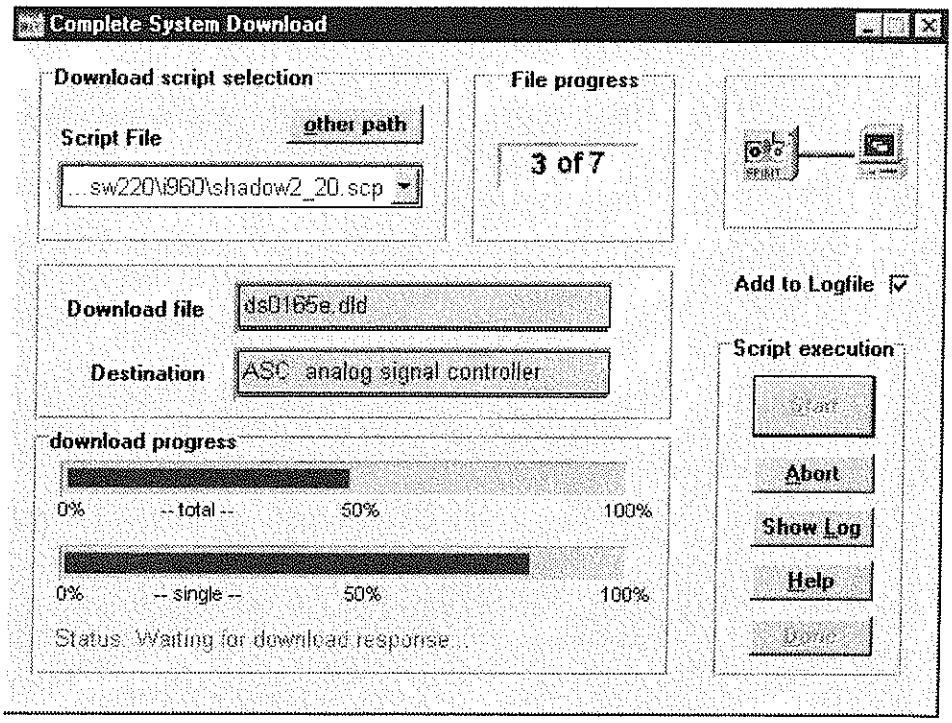
This dialog window allows to specify a program file that should be downloaded to the telecine. One of the available controller boards (units) in the film scanner must be selected as a destination. To initiate a download, do the following:

- **Select a file to be downloaded**
  This is done by clicking the arrow key in the selection field „Program File“. Now the files in the subdirectory DOWNLOAD are shown in a list and you can click one of the filenames. If the checkbox „only DLD“ is selected, only

the file with the DLD extension is shown in the list. Another less comfortable way to select a file is to use the button „other path". It opens a file selection dialog where you can select any file in your hard disk's or your network's directory tree.

- **Select a destination**
  This is done automatically in the most cases. For example, if the filename contains the unit name or the filename is associated to a specific unit in the configuration file DLDFILES.DAT. If the selection field „Destination" is not filled automatically, it can be done by clicking the arrow key in the selection field and then selecting one unit out of the dropdown list. The unit list is obtained from the configuration file FIXPARAMS.DAT.
- **Push the button „Download"**
  Now the communication with the selected unit starts via the iMCS network. The progress of downloading is shown by a „download progress" bar between 0% and 100%. Additionally, the actual state of the download process is displayed as text just beneath the progress bar. The running download can be aborted by pushing the „Abort" button if anything seems to run wrong, but this is not recommended. It would be better to wait for completion of download or for an automatic timeout.
- **Push the „Done" button**
  After the download process reached 100% and displayed the message „Download successful" and you do not want to start another download, you can terminate the dialog.

4.3.3 DOWNLOAD MENU ITEM „COMPLETE SYSTEM"



This dialog window allows to specify a script file that describes which program files should be downloaded to the telecine in a sequence. These script files are normally delivered together with the program files that have to be downloaded but can also be edited manually by the service personnel. To perform a „Complete system" download, do the following:

- **Select a script file to control the download**
  This is done by clicking the arrow key in the selection field „Script File". Now the script files in the subdirectory DOWNLOAD (extension SCP) are shown in a list and you can click one of the filenames.
  An other way to select a script file is to push the "other path" button. Then a file selection dialog is shown, where you can select any other folder to get the script file and the download files. This could be, for example, a folder on the actual Service-CD.
  The selected script file will be analyzed if all contained program files are available in the DOWNLOAD directory. For any file not found, a separate error message will pop up. Then the contents of the first entry in the script file will be shown in the fields „Download file" and „Destination. If the download is performed via remote access (PC-Duo) you can disable the animation by clicking once on the Spirit's icon. This will reduce the data traffic to the remote PC. ".
  Now you have the choice to start the download or to terminate the dialog by pushing the „Done" button.

- **Push the button „Start"**
  Now the communication with the selected unit starts via the iMCS network. The progress of downloading is shown by two 'download progress'-bars between 0% and 100%. One of it shows the total download time needed for all the files and one shows the single file download time of the actual processed file. Additionally the actual state of the download process is displayed as text just beneath the progress bar.
  The running download can be aborted by pushing the „Stop" button if anything seems to run wrong, but this is not recommended. It would be better to wait for completion of download or for an automatic time out. If the first download was successful, the next entry of the script file is displayed and after a delay of about 15 seconds the next download process will start.
- **Push the „Done" button:**
  After all downloads specified in the script file are done, the message „Download sequence ready" will be displayed and if you do not want to start another download sequence, you can terminate the dialog.

  If the download of one of the files failed due to timeout or communication errors, the same download will be retried two times. If the retries also failed, the progress bar will be switched to RED and the download will continue with the next file. At the end of the sequence the download log will be shown automatically. (There are two exceptions: A download failure to the unit NRC will not be shown, as this unit is optionally. A download failure to a FCP can be corrected by a successful download to a GCP in FCP-emulation mode if both downloads are available in the download script.)

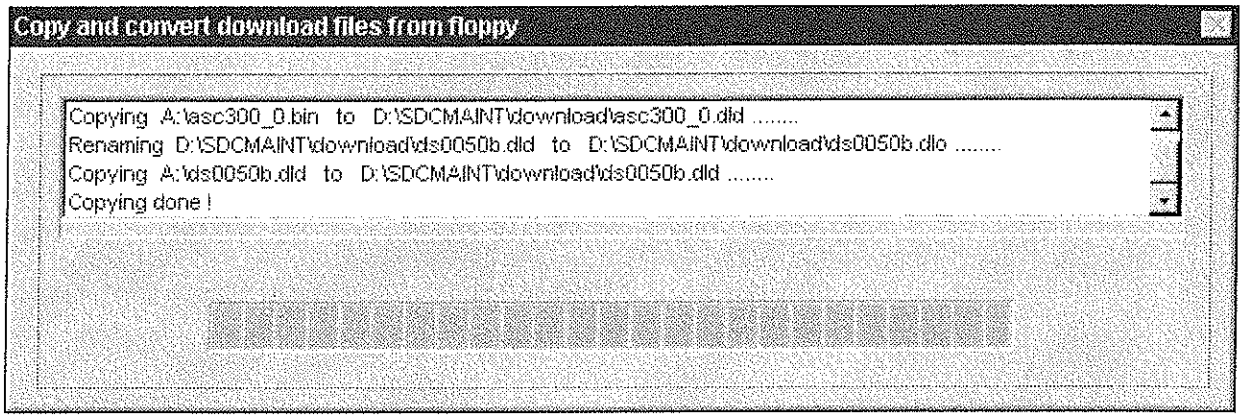
  If you want to see the logging of the download sequence during or after the download, you can push the "Show Log" button at every time. Then a list of the completed operations is shown. The button changes to the function "Hide Log" which you may push to switch the list off.

  The checkbox "Add to Logfile" is default checked. Then all the completed operations are written together with a time-stamp to the ASCII-logfile "Logfile\DownloadLogfile.log".

4.3.4 DOWNLOAD MENU ITEM „COPY & CONVERT FROM A:"

4.3.5 DOWNLOAD MENU ITEM „COPY & CONVERT FROM B:"

4.3.6 DOWNLOAD MENU ITEM „COPY & CONVERT FROM C:"

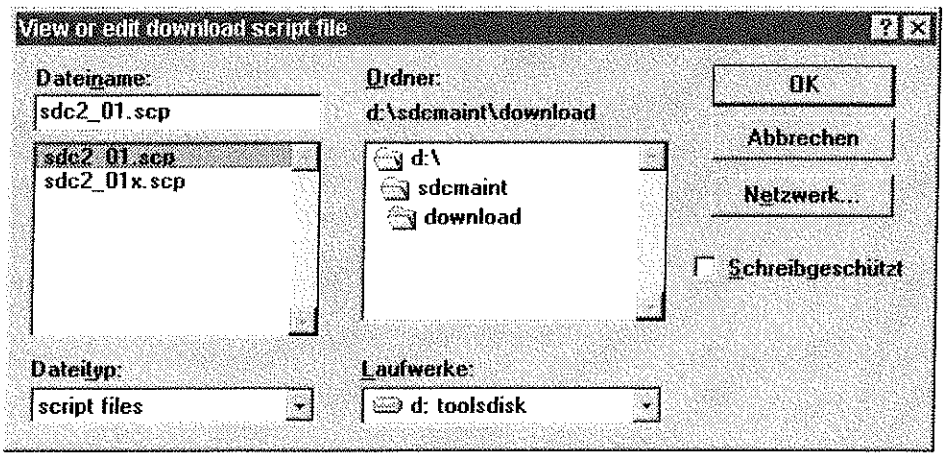

Copy and convert download files from floppy
Copying A:\asc300_0.bin to D:\SDCMAINT\download\asc300_0.dld .....
Renaming D:\SDCMAINT\download\ds0050b.dld to D:\SDCMAINT\download\ds0050b.dlo .....
Copying A:\ds0050b.dld to D:\SDCMAINT\download\ds0050b.dld .....
Copying done !

This dialog window allows to copy and convert files from a distribution disk in floppy drive A: or floppy drive B: or the root directory of C: to the local hard disk into the SDCMAINT subdirectory DOWNLOAD. The selection is done automatically using the extension of the files found on the floppy disk.

- Files with extension DLD are copied to the subdirectory DOWNLOAD.
- Files with extension BIN are copied to the subdirectory DOWNLOAD and renamed to *.DLD.
- Files with extension HEX are converted to the subdirectory DOWNLOAD as *.DLD files.
- Files with extension SCP are copied to the subdirectory DOWNLOAD.

If a file with the same name already exists in the destination directory, it will be renamed to *.DLO. The message window of the dialog shows the current running operation and a progress bar shows the percentage of every copy or conversion process. When all files on the floppy disk are processed, the dialog will be closed automatically.

4.3.7 DOWNLOAD MENU ITEM „EDIT SCRIPT FILE"

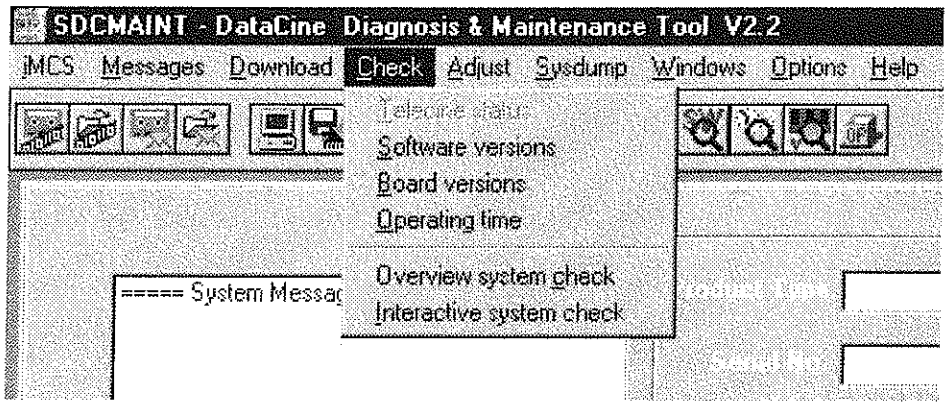


This menu item allows to view or edit a download script file in the DOWNLOAD subdirectory. The "file open" dialog shows the available script files in this directory and allows to open one of it by double clicking or selecting it and pushing the „OK" button. It is also possible to open a file in any other directory or a network by selecting another path.

NOTE! The file size must be less than 60 KB

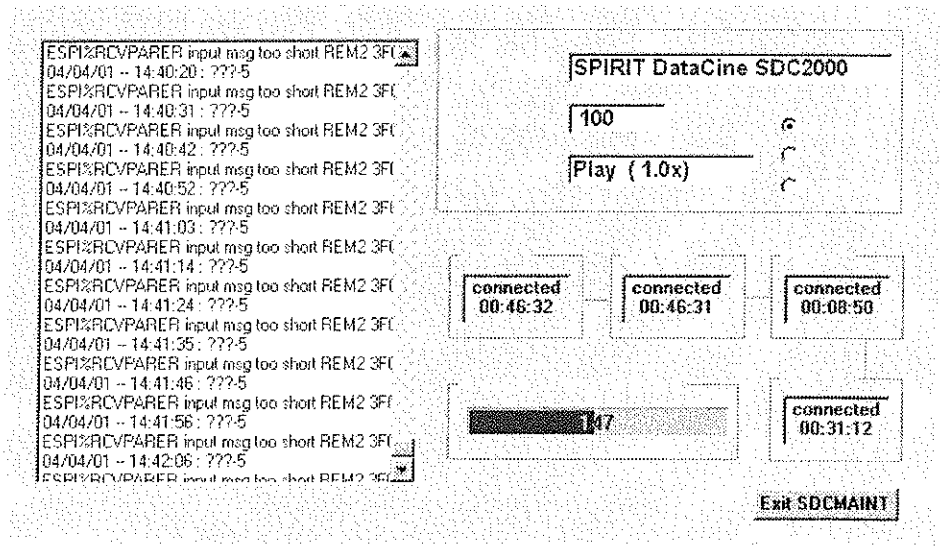
After opening a script file, you get the window of a built-in editor with the essential standard editor functions.
You can modify the file using the edit functions **„Cut, Copy, Paste** and **Clear"** and scan with the search functions **„Find, Find next and Replace"**.
At the end, you can write the file back with **„Save or Save as"** for a new filename.
You can also create a new file with **„File New"** and leave the editor with **„File Exit".** There is an additional Options menu where you can change the font and the color of text and background.

4.4 PULLDOWN MENU „CHECK"



The menu items of the Check pulldown menu provide the functions to request the telecine's software versions, the board versions and the operating times, and to perform full system checks.

4.4.1 CHECK MENU ITEM „TELECINE STATUS“


ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:40:20 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:40:31 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:40:42 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:40:52 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:03 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:14 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:24 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:35 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:46 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:41:56 : ???-5
ESPI%RCVPARER input msg too short REM2 3F(
04/04/01 -- 14:42:06 : ???-5
SPIRIT DataCine SDC2000
100
Play (1.0x)
connected
00:46:32
connected
00:46:31
connected
00:08:50
47
connected
00:31:12
Exit SDCMAINT

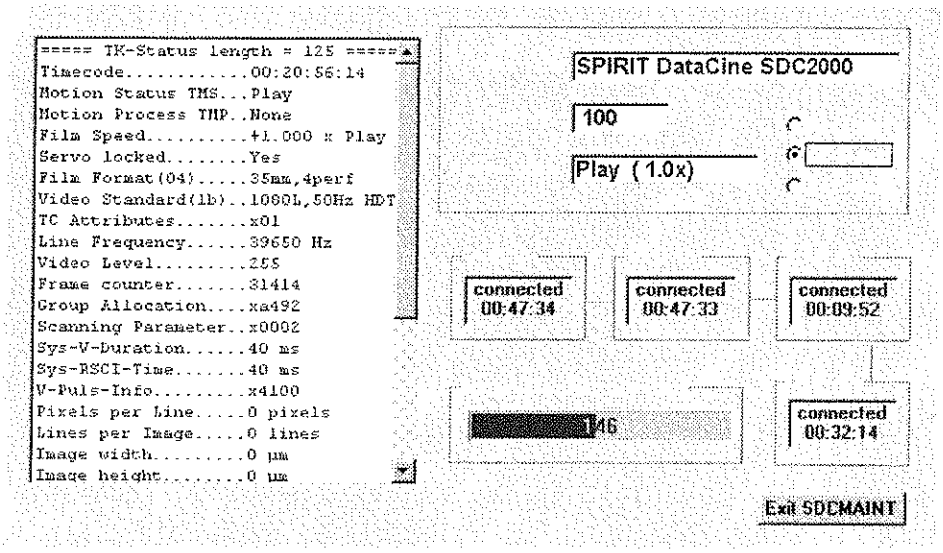
The dialog "Monitoring of TK status" is normally started together with the SDCMAINT main application.

Primarily it shows the **product type** of the connected device, e.g. "SPIRIT DataCine SDC2000". It also shows the **serial number** of the connected device. This number is also displayed at the right side of the toolbar, but in the TK status dialog it will be updated cyclically. In the third line the actual **motion status** is displayed together with the actual film-speed.

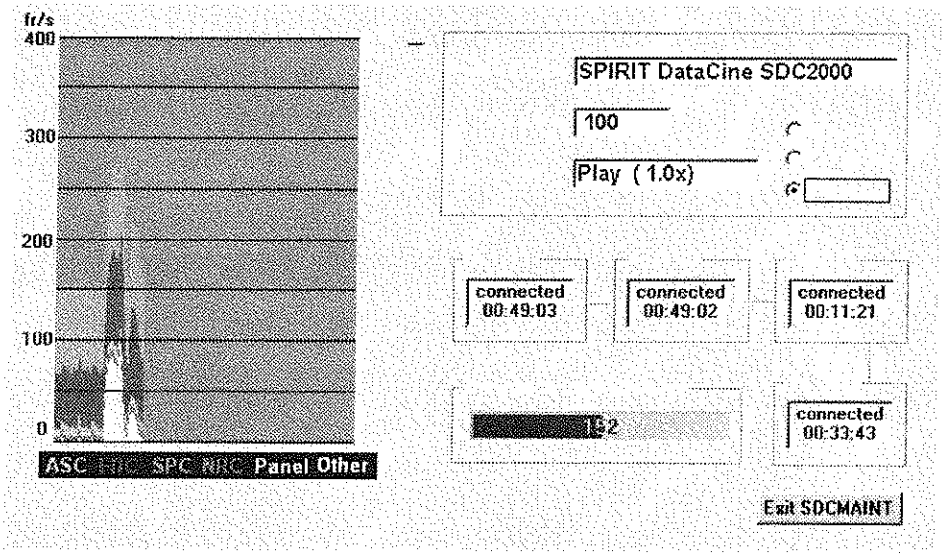
Additionally, the connection status of the device's units is shown. Therefore the "heartbeat" of the units is analyzed, which informs every second about the conditions 'online' or 'connected' via the iMCS network. A timeout detects whether one unit goes offline or restarts. Then the 'connected' counter begins to count at zero. The 'connected' time is displayed in the format hh:mm:ss (h = hours, m = minutes, s = seconds). It represents the time, the unit is running since the last restart.
In the frame "Network activity" a bar is displayed that shows the number of received telegrams within a second. The color of the bar shows the type of the telegrams:

- blue: only iMCS telegrams
- red: only non-iMCS telegrams (maybe you are connected to the wrong LAN)
- magenta: mix of both telegram types

On the left side a table with the last received system messages is displayed. Each message is leaded by the event's time and date. This list is not written to a logfile. So if you need this, use the pulldown menu item 'Messages - Record new'.



The radio button 'TK-Status' opens a list box showing all the parameters contained in the TK status telegram. This parameter list is updated cyclically and can be moved with a scrollbar at the right side.

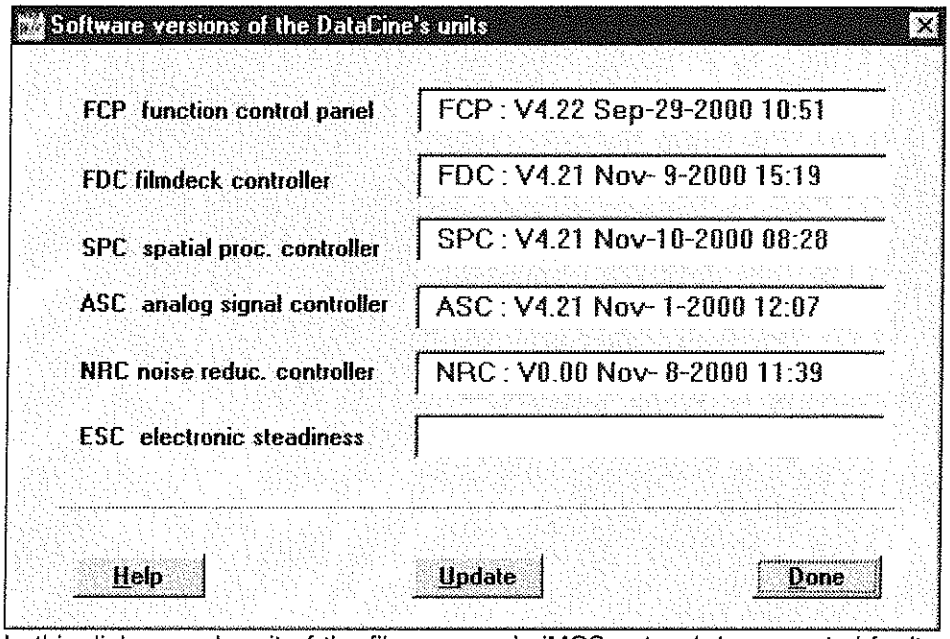


When you push the radio-button "Histogram" histogram bars of the iMCS network activity are written on the left graphic area of the telecine status dialog. A scale of 0...400 frames per second is added at the right side and a color reference bar at the lower side of the graphic area. Each second a bar is added. The length of the bar represents the amount of activity of the units. The color marks the source of the telegrams on the network.

At the lower left edge of the dialog, an information text can be displayed. It can be the company name, the operator using it or any info about the suite or the connected device. This information text can be entered using the pulldown menu item 'Options - Information text'. It will be stored permanently.

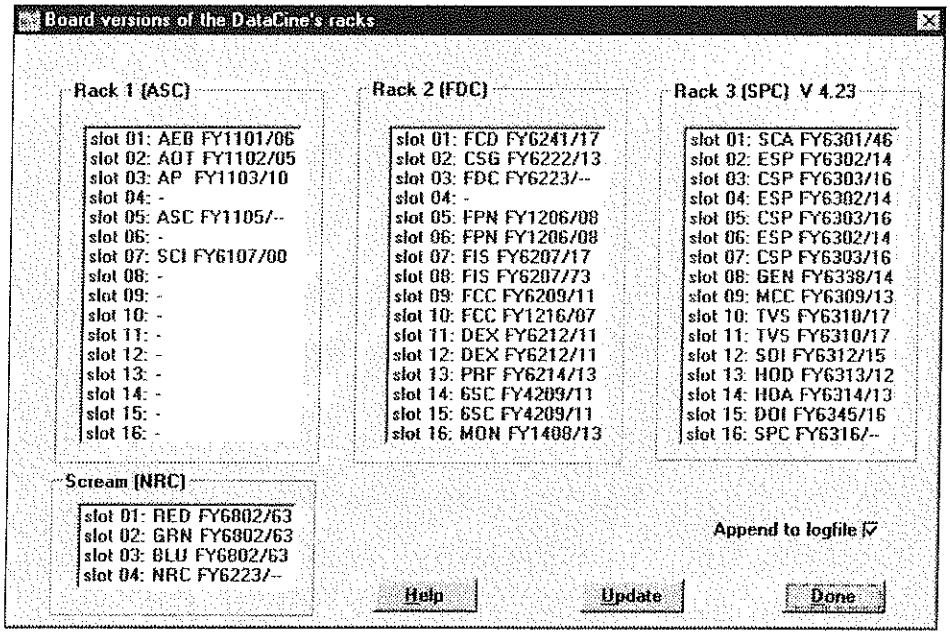
Finally, at the lower right corner of the dialog there is a button 'Exit SDCMAINT' to comfortably close the application.

4.4.2 CHECK MENU ITEM „SOFTWARE VERSIONS“



In this dialog, each unit of the film scanner's iMCS network is requested for its actual software version. The answer is displayed separately for each unit showing the unit's name, the version number and the release date. If not all available units have answered in time, you can repeat the request by pushing the „Update“ button. The dialog can be closed by pushing the „Done“ button.

4.4.3 CHECK MENU ITEM „BOARD VERSIONS“

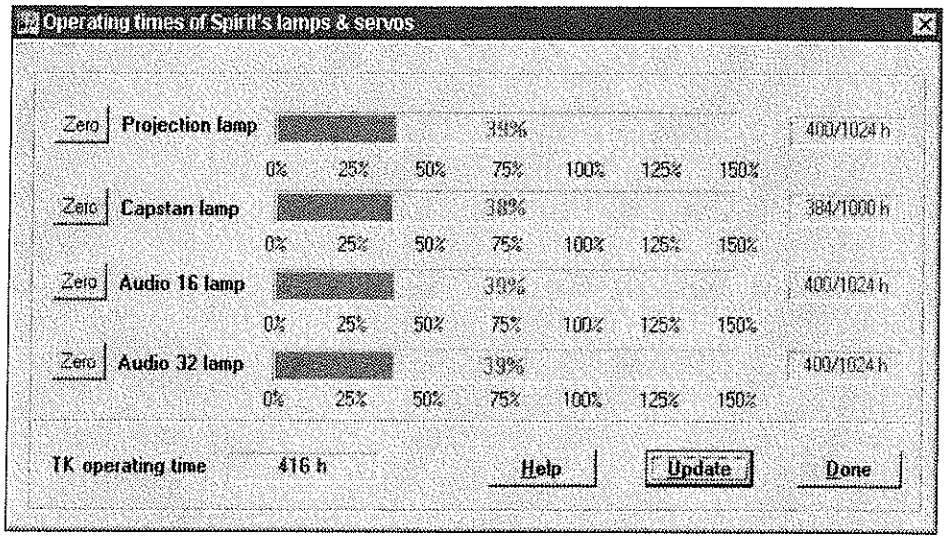


In this dialog, the main controllers of each rack are requested for the board versions within their 16 slots. The controllers are the unit ASC for rack 1, the unit FDC for rack 2 and the unit SPC for rack 3. The rack controllers pass on the requests to the boards via the RSCI link (Rack Serial Control Interface). The answers are displayed in three tables, one per rack. The lines are marked from

„slot 01:“ to „slot 16:“. Then follows the board's function abbreviation, the board's type name and behind a slash, the actual version number. Slots that show only a dash („-“) are unused or provide no RSCI connection. If not all available units have answered in time, you can repeat the request by pushing the „Update“ button. The dialog can be closed by pushing the „Done“ button.

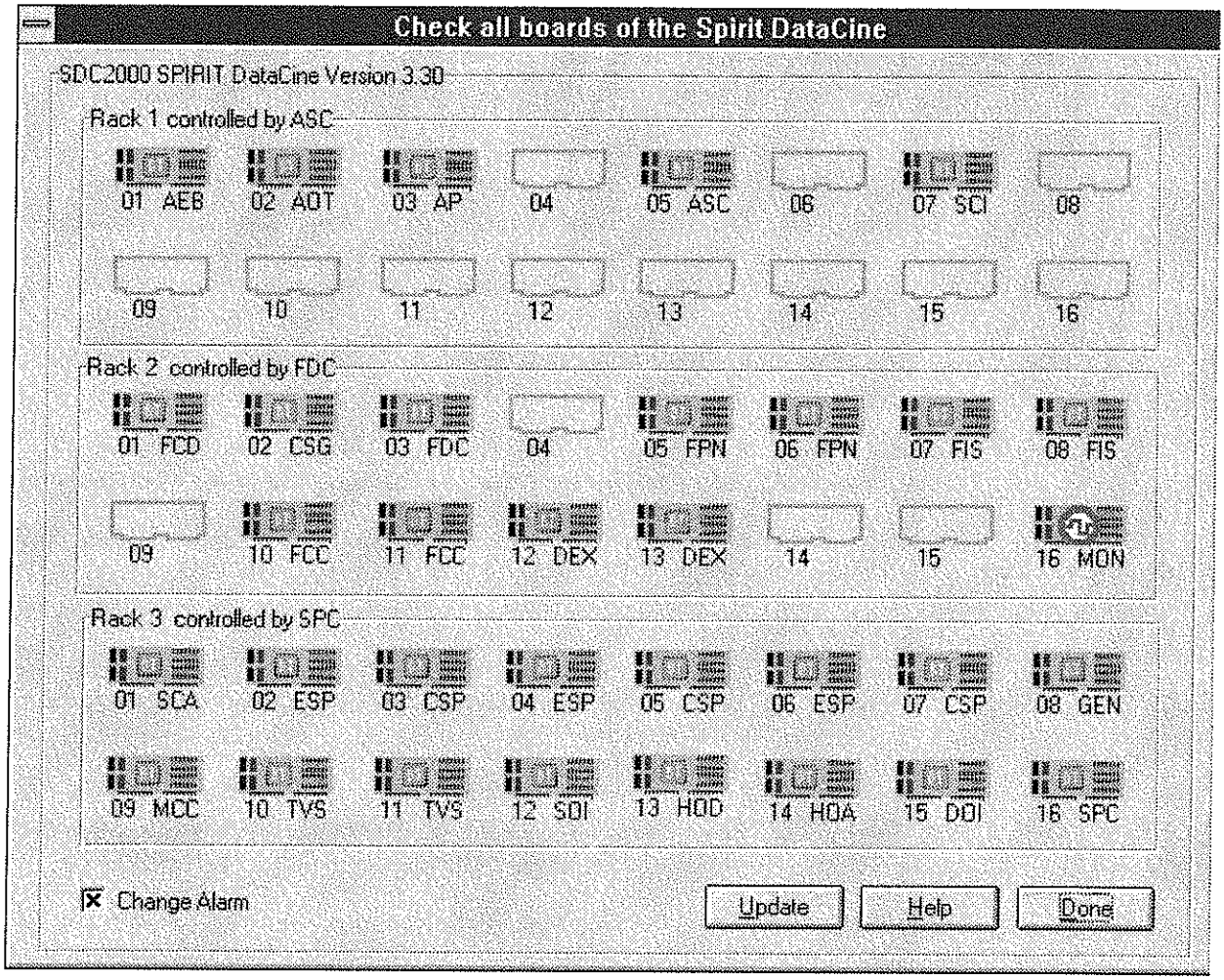
4.4.4 CHECK MENU ITEM „OPERATING TIME“

This dialog shows the actual operating time counters for the projection lamp, the capstan lamp, the audio 16 and audio 32 lamp as well as the SDC 2000 global operating time.

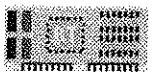


The counter values and the recommended lifetime of each lamp are displayed at the right side. Additionally, there is shown a progress bar with the operating time related to the lifetime in percent. This makes it easier to overlook the right time to change the bulbs (e.g. at the 100% position).
These counters can be also updated while the dialog is open by pushing the „Update“ button. You can close the dialog by pushing the „Close“ button.
There are „Zero“ buttons that allow to reset the operating time of each bulb in the film scanner. They should be used after replacing one of the bulbs. A double security request protects against accidentally pushing these buttons.

4.4.5 CHECK MENU ITEM „OVERVIEW SYSTEM CHECK“



The menu item „Overview system check“ graphically shows each board of the three racks of SDC 2000. In the headline of the frame, you can read the actual software version of the connected SDC 2000, in the above example it is version 3.30. Then you see the 3 racks each of it containing 16 printed circuit boards. These boards are marked differently by according to the results of the automatic system check. The following shows the meaning of the different pictures:



The board answered the check correctly and no error was detected!

The board did not answer correctly. Perhaps it is not inserted in the slot or it is damaged!

The board is just being checked in the moment!

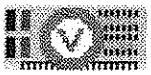
The board cannot be checked by the rack controller or the slot is basically empty!

The rack controller has not answered the check request, a timeout occurred!

The board has detected an over temperature condition! Please check the airflow in the rack (the fans and the filters).

The board has detected a sync signal support failure. That means, one of the necessary sync pulses is missing.

The board has detected an RSCI data link failure. That means, the self-test of the data link failed. There are many reasons possible: power supply, driver chips, link interrupt or clock signal missing.

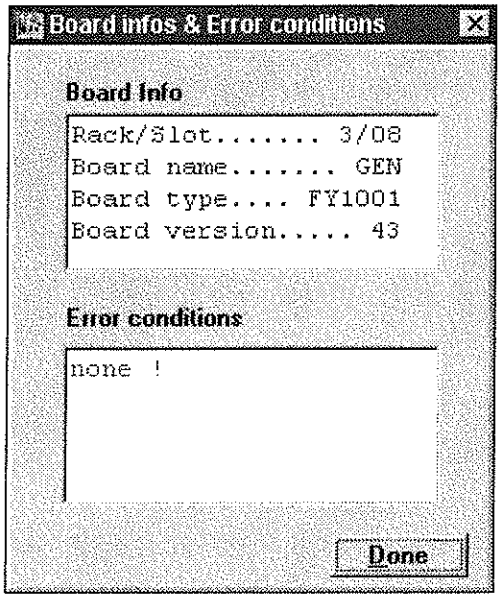


An invalid board version has been detected. That means, the firmware and the hardware of this board have not the necessary minimal level.

An invalid board type has been detected. That means, there is a wrong board inserted into the slot.

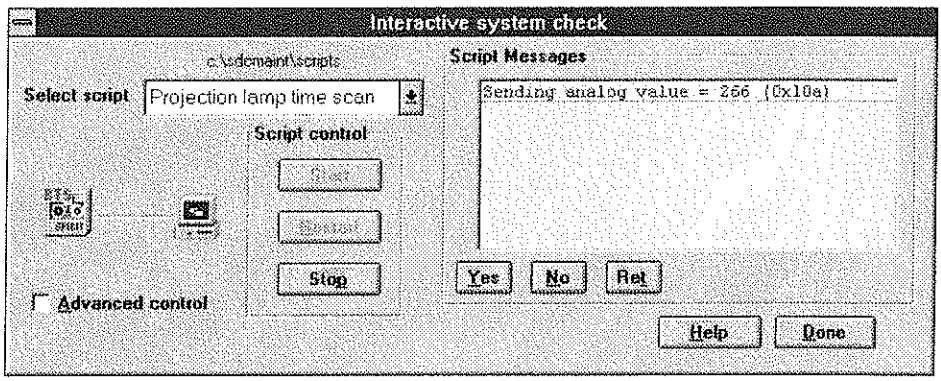
Remark:
If the Spirit software version is earlier than V3.3, only the static conditions at the last SDC 2000 power-up are displayed. They will only be updated by restarting the SDC 2000 system software (see pulldown menu „Adjust Restart all units").

If you want to get additional information about one of the boards, just double-click the board. Then, a message window opens showing detailed data such as board name, board type and slot number and in an extra field, the detailed error condition messages.



The checkbox **„Change Alarm"** allows to enable / disable a PC sound event at each change of the online test conditions.
The Update button sends a new check request to the SDC 2000 and updates the graphic display. This function is only necessary if a reply timeout occurred when starting the „Overview system check" dialog.
The Help button opens the SDCMAINT help file and shows context-sensitively the help info about „Overview system check".
The "Done" button finally closes the „Overview system check" dialog.

4.4.6 CHECK MENU ITEM „INTERACTIVE SYSTEM CHECK"



The menu item „Interactive system check" provides a means to perform some special checks and tests to the Spirit DataCine film scanner. These checks send telegrams to it, wait for answers from it and communicate with the operator at the PC.
Every check is controlled by a script file that contains a sequence of BASIC-like commands in ASCII text format.

4.4.6.1 STARTING A DIAGNOSIS SCRIPT

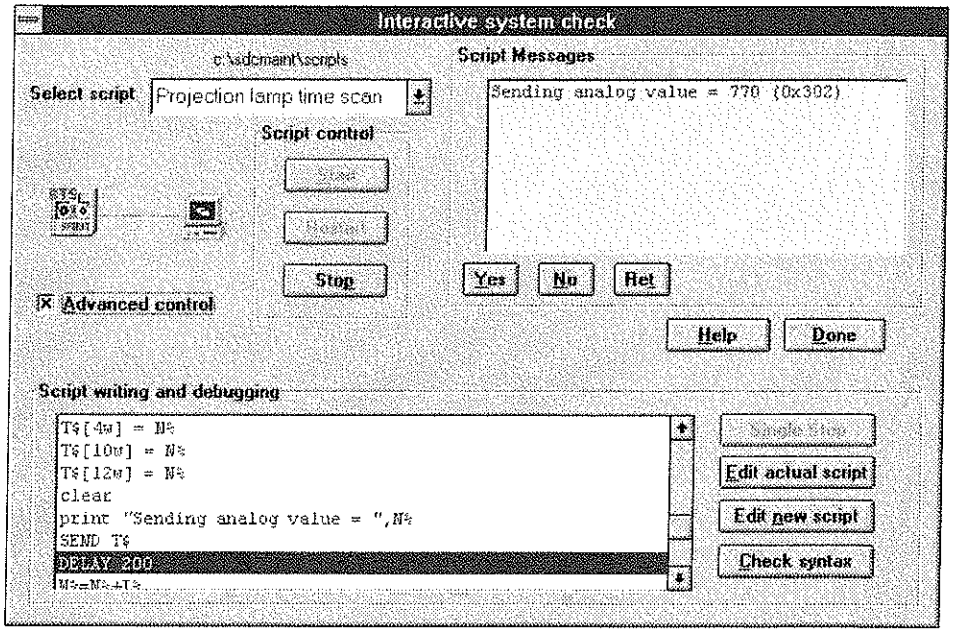
After selecting the menu item „Interactive system check", a dialog window opens and shows a selection field for the name of the script and a yellow screen

for the dialog with the operator. The script file can be selected by a long filename in the selection field.
When it is selected, an immediate syntax check runs and the result is shown on the dialog screen. A more detailed description of the script's function is also shown on the screen.
Now, the Start button must be pushed to start the execution of the diagnosis script. All the farther actions are controlled by the contents of the script file. While the script is running, it is possible to stop the script with a STOP button and to continue the run with the START button or to start the script from the beginning by pushing the RESTART button.

4.4.6.2 PROGRAMMING NEW DIAGNOSIS SCRIPTS

For advanced operators who know the iMCS protocol and the internal operations of the SDC 2000, it is easy to create new script files or to modify existing ones.

Therefore, a selection field „Advanced control" is available that expands the „Interactive system check" window and shows some additional controls to edit, modify and test the script files. There are buttons to perform single steps, to edit the actual or a new script file and to perform a syntax check.
There is also a list window, which shows the actual command line within the script file. Here it is possible to change the actual command line just by clicking one line of the list windows. This will be very helpful during single-step execution of the script.



4.4.6.3 SDCMAINT BASIC INTERPRETER

The script files are a sequence of BASIC-like commands. The standard dialog commands (PRINT, INPUT) are available as well as mathematics (SET) and branch command (IF, GOTO).

There are two types of variables implemented:

- the string variables
- the integer variables

The 26 pre-defined string variables are named A$....Z$ and may contain up to 256 bytes of data, either an ASCII string or a binary telegram. The 26 pre-defined integer variables are named A%....Z% and may contain a long integer variable between 0 and 4.000.000.000.
The following commands are valid:

```
;       :       BEEP   CLEAR
DELAY DESTINATION GOTO  IF
INFO   INPUT  NAME  PRINT
SOURCE        SEND  SET    WAIT
WAITANY
```

Table of description on the shortcuts used:

Shortcut	Description
<byte-const>	integer value 0...255
<compare>	< | = | >
<constant>	long integer value (max. +/- 2.147.000.000)
<label>	ASCII name (not case-sensitive)
<operator>	+ | - | * | /
<string>	string constant in quotation marks like "any text"
<telegram>	binary telegram data like hh,hh,hh,hh (hh=00...FF)
<unit>	ASC | FDC | SPC | GWC | GWI | PC | ESS | FCP
<word-const>	integer value 0...65535
X$	string variable (max. 256 bytes)
X%	long integer variable (max. +/- 2.147.000.000)

See the following table for a detailed description and some examples for the SDCMAINT BASIC commands:

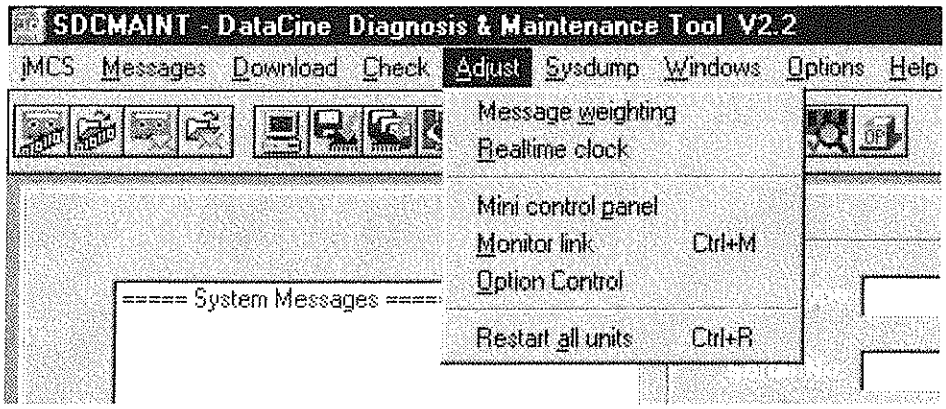
Command syntax	Description	Example
:<label>	jump label	:SENDLOOP
;	comment line	; This is a comment
BEEP	generates a sound	BEEP
CLEAR	clears the dialog screen	CLEAR
DELAY <constant>	delays the script execution for n milliseconds	DELAY 1000
DELAY X%	delays the script execution for X% milliseconds	DELAY T%
DESTINATION "<unit>"	presets the dest. unit for a SEND command to a constant	DESTINATION "ASC"
DESTINATION X$	presets the dest. unit for a SEND command to a string variable	DESTINATION U$
GOTO <label>	branches to a jump label line	GOTO SENDLOOP
IF X$ = <string> GOTO <label>	branches to label if string and string variable are equal	IF A$ = "Yes" GOTO ok
IF X% <compare> <constant> GOTO <label>	branches to label if compare of integer and variable is ok	IF N% < 100 GOTO loop
IF X% <compare> Y% GOTO <label>	branches to label if compare of two integer variables is ok	IF I% = N% GOTO ready
INFO <string>	display an info text at selection of a script	INFO "This is an info"
INPUT X$	reads a string from the keyboard (terminated with <RET>)	INPUT A$
INPUT X%	reads an integer from the keyboard (terminated with <RET>)	INPUT N%
NAME <string>	defines a long filename for the script file select box	NAME "Testing luminance"
PRINT	prints an empty line to the display screen	PRINT
PRINT <string>	prints a constant string to the display screen	PRINT "Enter a value:"
PRINT <string>,X$	prints a string and a string variable to the display screen	PRINT "The string is:",S$
PRINT <string>,X%	prints a string and an integer variable to the display screen	PRINT "The value is:",N%
SEND <string>	sends an iMCS telegram from a string constant	SEND 03,00,3e,07,ff
SEND X$	sends an iMCS telegram contained in a string variable	SEND T$
SET X$ = <string>	presets a string variable	A$ = "Test done !"
SET X$ = <telegram>	stores a binary telegram into a string variable	T$ = 02,00,a9,de
SET X$ = Y$ + Z$	joins two string variables together to another string variable	A$ = B$ + C$
SET X$[<byte-const>] = <byte-const>	modifies one byte of a string variable at an offset with a byte value	T$[5] = 128
SET X$[<byte-const>] = X%	modifies one byte of a string variable at an offset with a byte value	B$[22] = N%
SET X$[<byte-const>W] = <word-const>	modifies two bytes of a string variable at an offset with a word value	T$[5W] = 16835
SET X$[<byte-const>W] = X%	modifies two bytes of a string variable at an offset with a word value	C$[16W] = M%
SET X% = <constant>	presets an integer variable	N% = 8196
SET X% = X$[<constant>]	gets one byte of a string variable at an offset into an integer variable	N% = T$[8]
SET X% = X$[<constant>W]	gets two bytes of a string variable at an offset into an integer variable	M% = T$[12W]
SET X% = Y% <operator> <constant>	calculates an integer variable using a constant	N% = N% + 10
SET X% = Y% <operator> Z%	calculates an integer variable from two others	I% = J% * K%
SOURCE "<unit>"	presets the source unit for a SEND command to a constant	SOURCE "FDC"
SOURCE X$	presets the source unit for a SEND command to a string variable	SOURCE U$
WAIT X$, <constant>	waits for a telegram to PC contained in a string variable for n sec.	WAIT T$,5000
WAIT X$, X%	waits for a telegram to PC contained in a string variable for n sec.	WAIT T$, N%
WAITANY X$, <constant>	waits for any telegram contained in a string variable for max n sec.	WAIT T$,5001

As usual in BASIC, the SET command is optional. The command lines „SET A% = 145“ and „A% = 145“ are interpreted identically.

The following shows an example script file implementing an incrementally sending loop:

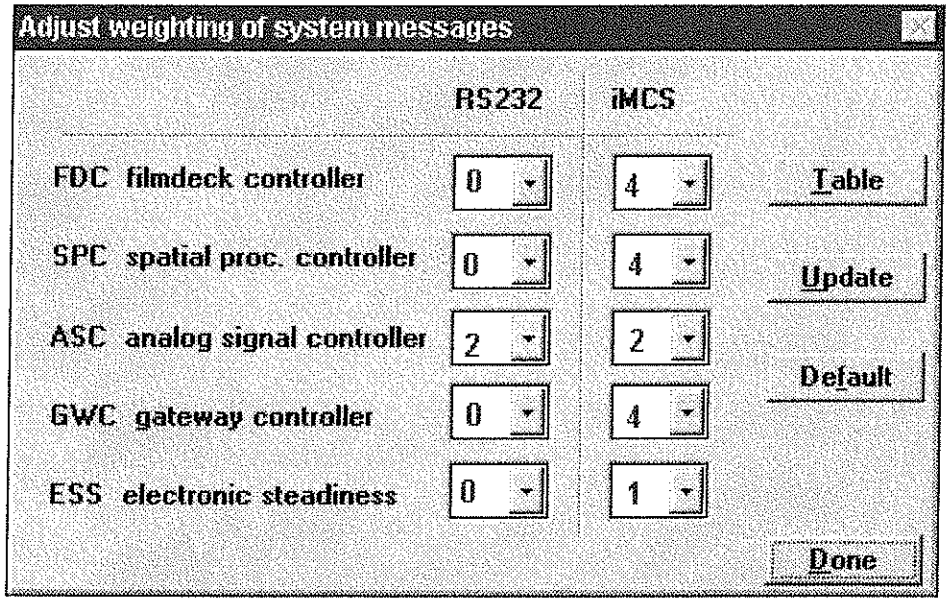
```
;-----------------------------------------------
; Loop scan of projection lamp time
;-----------------------------------------------
NAME "Projection lamp time scan"
INFO "This test sends Projection time I/Fs"
CLEAR
print "What is the increment ? "
input I%
SOURCE "ASC"
DESTINATION "PC "
T$ = 23,01,FF,A1,00,00,04,00,FF,A3,00,00,00,00,04,00,02

:LOOP0
N%=0
:LOOP1
T$[4w] = N%
T$[10w] = N%
T$[12w] = N%
clear
print "Sending analog value = ",N%
SEND T$
DELAY 200
N%=N%+I%
IF N%<1537 goto LOOP1
GOTO LOOP0

:exit
print "ready !"
```

4.5 PULLDOWN MENU „ADJUST“


SDCMAINT - DataCine Diagnosis & Maintenance Tool V2.2
iMCS Messages Download Check Adjust Sysdump Windows Options Help
Message weighting
Realtime clock
Mini control panel
Monitor link Ctrl+M
Option Control
Restart all units Ctrl+R
===== System Messages =====

The items in the Adjust pulldown menu allow to perform some changes of parameters of the telecine. These are the message weightings, the real-time clock, the mini control panel and the monitor link.

4.5.1 ADJUST MENU ITEM „MESSAGE WEIGHTING“

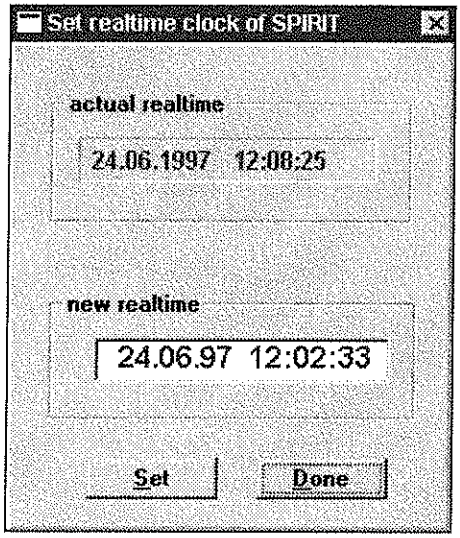


This dialog allows to modify the default weighting limits of the system messages. Here, each unit can be set up only to send system message to the RS232 link or to the iMCS network with a weighting between the specified one and the highest weighting of 6. This means, if you specify a weighting of 5, only system messages with weightings of 5 and 6 will be sent to the link or network.
The default adjustment is 0 for the RS232 link and 4 for the iMCS network.
You can modify each weighting value by pushing the down arrow in the selection field and select one of the values from the dropdown list. There are some additional buttons:

- **„Table“**
  shows a pop window with a description of the meanings of the 7 weightings.
- **„Update“**
  requests all units once again for their actual weighting limits.

- **„Default"**
  switches all units back to their default weighting limits of 0 for RS232 and 4 for iMCS.
- **„Done"**
  finally closes the „Message weighting" dialog.

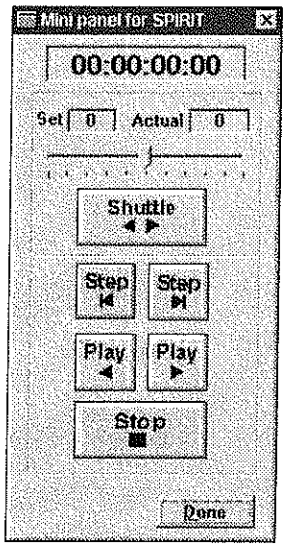
4.5.2 ADJUST MENU ITEM „REAL-TIME CLOCK"



This menu item allows you to set the SDC 2000 internal real-time clock. Although the unit has a battery-buffered internal real time clock it is necessary to correct the time after a period when a delay has been accumulated.
In this dialog, the upper field „actual real time" shows the internal clock of SDC 2000 and the lower field „new real-time" shows the actual value of the PC's internal real time clock. This field can be modified by setting the cursor on it and overwriting the values.

Pushing the button „Set" transfers the new real time to the SDC 2000, first to the unit ASC and from there to all the other units within the iMCS network. The field „actual real time" will then show the new value. The „Done" button finally closes the dialog.

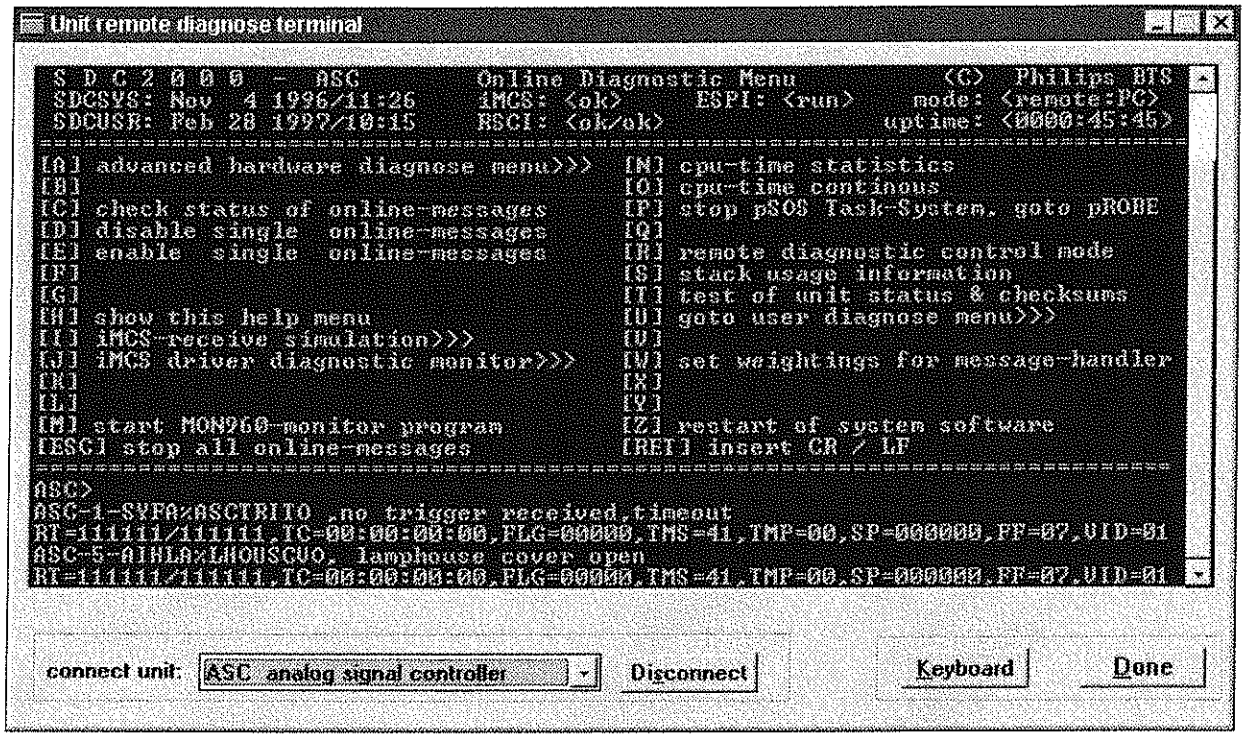
4.5.3 ADJUST MENU ITEM „MINI CONTROL PANEL"



This dialog window provides a mini control panel for the standard film motion functions of the film scanner. It is very similar to the local panel at the right edge of the Spirit. There are buttons for the functions Shuttle, Step backwards, Step forwards, Play reverse, Play and Stop available. There is also a horizontal slider which allows to preset the Shuttle speed to a value between -25 and +25 times Play. The selected value is shown in the „Set" field while the actual value is displayed in the „Actual" field.

At the upper edge of the panel, the actual film deck timecode is displayed in the standard format hh:mm.ss:ff.
The actual film motion status is displayed as at the local panel by illuminating the corresponding function keys with a yellow background.
This panel dialog can be closed by pushing the „Done" button at the lower right corner.

4.5.4 ADJUST MENU ITEM „MONITOR LINK“


Unit remote diagnose terminal
S D C 2 0 0 0 - ASC Online Diagnostic Menu (C) Philips BIS
SDCSYS: Nov 4 1996/11:26 iMCS: <ok> ESPI: <run> mode: <remote:PC>
SDCUSR: Feb 28 1997/10:15 RSCI: <ok/ok> uptime: <0000:45:45>
[A] advanced hardware diagnose menu>>> [N] cpu-time statistics
[B] [O] cpu-time continous
[C] check status of online-messages [P] stop pSOS Task-System, goto pROBE
[D] disable single online-messages [Q]
[E] enable single online-messages [R] remote diagnostic control mode
[F] [S] stack usage information
[G] [T] test of unit status & checksums
[H] show this help menu [U] goto user diagnose menu>>>
[I] iMCS-receive simulation>>> [V]
[J] iMCS driver diagnostic monitor>>> [W] set weightings for message-handler
[K] [X]
[L] [Y]
[M] start MON960-monitor program [Z] restart of system software
[ESC] stop all online-messages [RET] insert CR / LF
ASC>
ASC-1-SYFA>ASCTRITO ,no trigger received,timeout
RT=111111/111111,TC=00:00:00:00,FLG=00000,TMS=41,TMP=00,SP=000000,FF=07,VID=01
ASC-5-AIHLA>LHOUSCVO, lamphouse cover open
RT=111111/111111,TC=00:00:00:00,FLG=00000,TMS=41,TMP=00,SP=000000,FF=07,VID=01
connect unit:
ASC analog signal controller
Disconnect
Keyboard
Done

This menu item opens a virtual ASCII terminal and allows to virtually connect to any of the controller board's local RS232 diagnosis links. This „connection“ is however done via the iMCS network which has the disadvantage that the network load increases while a connection is established. Therefore, some system error messages may occur in this mode.

Warning! This function should not be used during time critical operations.

To connect to a unit, push the down arrow in the „connect unit“ field and select one of the units in the pulldown list. If the connection is successful, a corresponding message appears on the terminal screen and the name of the selected unit stays visible in the „connect unit“ field. If the connection fails, that means if the unit did not answer to the connection request, the „connect unit“ field will be cleared.

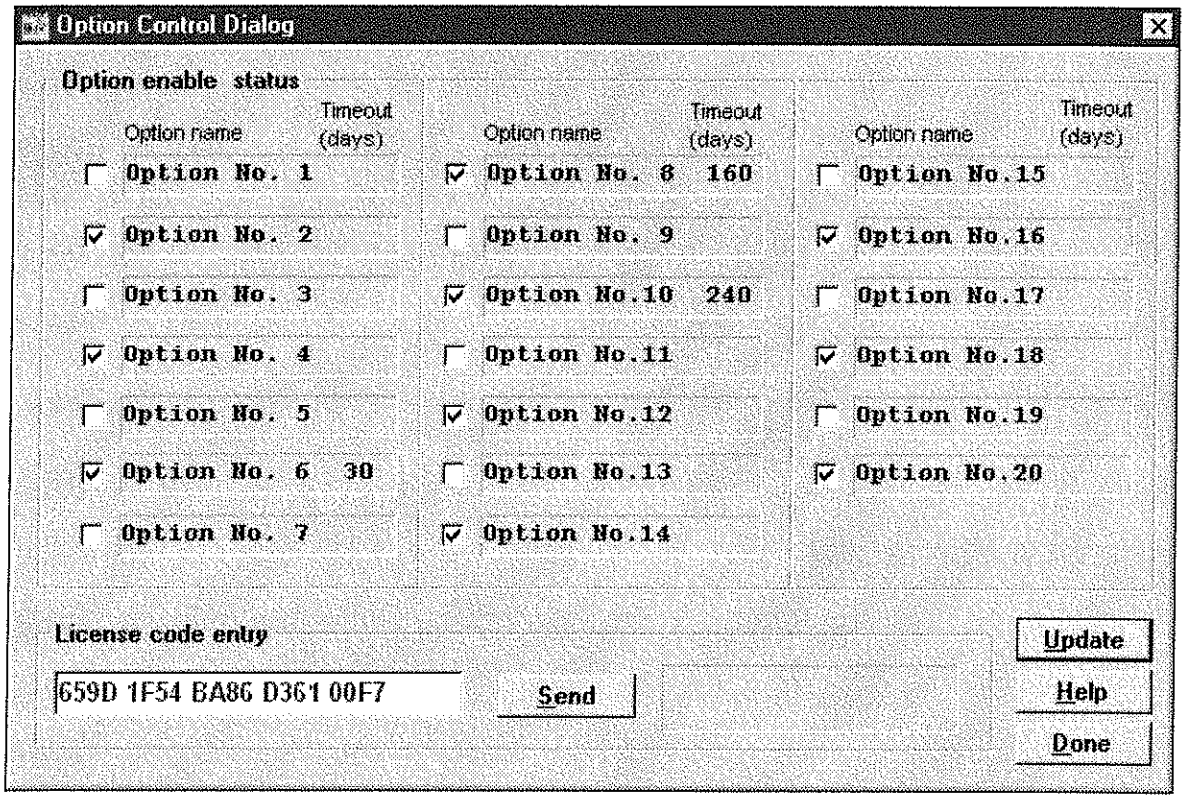
When a connection is established, you can either change the connection by selecting another unit in the „connect unit“ field or you can clear the connection by pushing the „Disconnect“ button.

You may use the standard PC keyboard as input device for the virtual ASCII terminal. If you prefer it, you can activate an additional window with a soft key keyboard as input device by pushing the „Keyboard“ button. This keyboard window can be moved to any position on the PC screen and can be closed with the „Exit“ button.

The virtual terminal dialog can be closed by pushing the „Done“ button. Please remember to disconnect the unit prior to closing the dialog!

(Remark: This function is only available in Service mode!)

4.5.5 ADJUST MENU ITEM "OPTION CONTROL"



The Option Control dialog allows to view the available options of the connected telecine and which of them are already activated. It also shows the number of remaining days, if there is an option with timeout loaded. All these inquiries are requested from the unit FDC.

The second functionality of this dialog is to enter the license code to enable a new option.

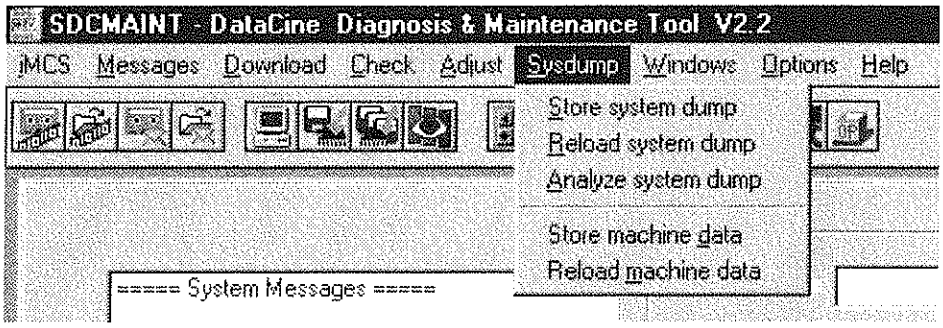
To do this, move the cursor to the edit field 'License code entry' and enter the license code you got from Thomson Multimedia. Then push the 'Send' button.
In an information box to the right of it, a success message or an error message will be shown. If the license code is ok, it is sent to the unit FDC and stored in the telecine's non-volatile RAM.
To close the dialog push the „Done" button.

Note: This dialog is supported from Spirit DataCine V4.00 and later!

4.5.6 ADJUST MENU ITEM „RESTART ALL UNITS"

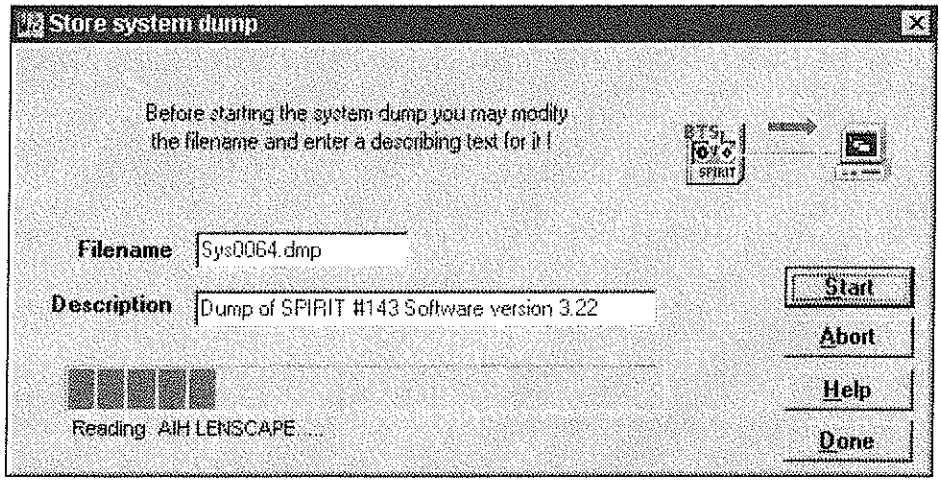
This menu item can also be executed with the shortcut Ctrl-R. It brings a security request whether you are really sure to reset all the processor boards in the Spirit DataCine film scanner. When you acknowledge the request, a restart command is sent to all known units.

4.6 PULLDOWN MENU „SYSDUMP“


SDCMAINT - DataCine Diagnosis & Maintenance Tool V2.2
iMCS Messages Download Check Adjust Sysdump Windows Options Help
Store system dump
Reload system dump
Analyze system dump
Store machine data
Reload machine data
===== System Messages =====

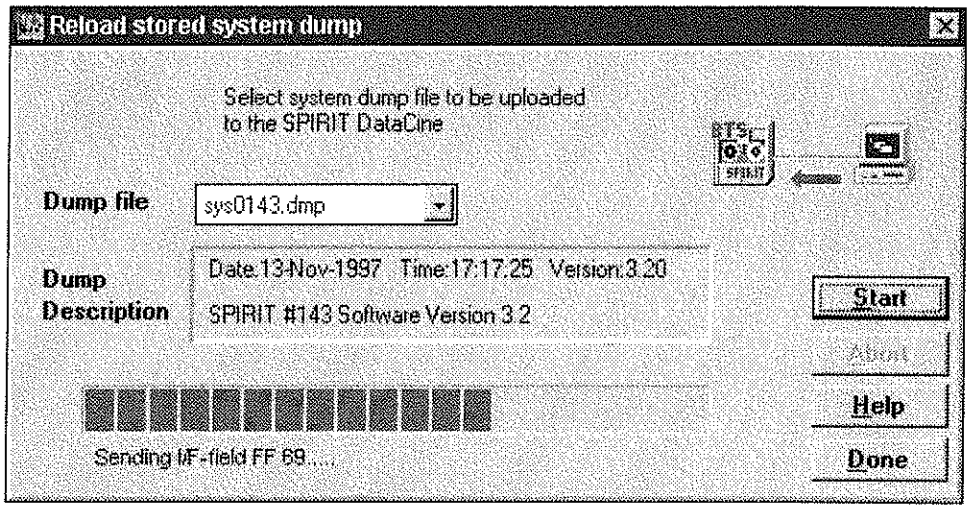
The items in the Sysdump pulldown menu allow to perform dumps of the system parameters of the SDC 2000. They can be analyzed or reloaded to the connected Spirit DataCine.

4.6.1 STORE SYSTEM DUMP



The dialog „Store system dump“ allows to write all the actual parameters of the SPIRIT DataCine film scanner into a file on the Diagnosis PC's hard disk. Before starting the system dump, you may modify the two entry fields of the dialog: the filename and the description text. A default filename is generated automatically as „SYSnnnn.DMP“ where nnnn is a four-digit number which is counted up with each completed system dump.
You can change this default filename by overwriting it with another standard DOS filename (8 characters for name & 3 characters for extension).
The system dump will be stored in the subdirectory „SYSDUMP“ of the SDCMAINT main directory. The description text can be any ASCII text and will be stored together with the system dump data. Additionally, the actual date and time are stored together with it.
When you push the „Start“ button, the dump process starts and requests all the „Information fields“ from the different rack controllers of the SPIRIT DataCine film scanner. The progress is shown by a percentage bar and below it, the actual field name is displayed. A dump will last about one minute. You can abort a running system dump by clicking the „Abort“ button. To close the dialog, push the „Done“ button.

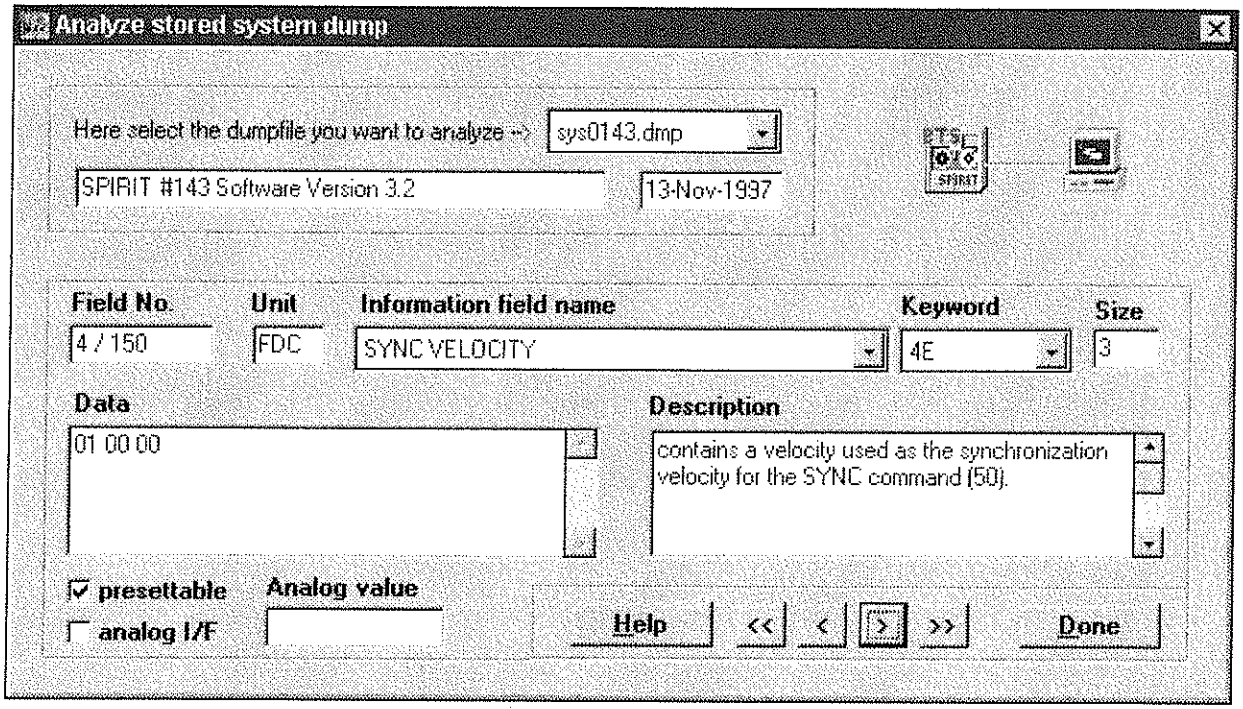
4.6.2 RELOAD SYSTEM DUMP



The dialog „Reload system dump" allows to load all parameters out of a dump file on the PC's hard disk to the SPIRIT DataCine film scanner. To perform a reload, you have to select a filename from the list field „Dump file" which shows all the files in the SDCMAINT subdirectory SYSDUMP. After selection of a file, the description text, the date and time of the dump and the software version of the SDC 2000 system are shown in the message field „Dump Description".
Now you can push the „Start" button to start the dump download. An extra security request message appears, warning that you will overwrite all actual system parameters of your currently connected Spirit DataCine film scanner.
If you acknowledge the security request with „Yes", the reload starts. The progress is shown by a percentage bar and below it, the actual field code is displayed. A dump reload will last about one minute. You can abort a running system dump reload by clicking the „Abort" button. To close the dialog, push the „Done" button.

NOTE!
To avoid the loss of all actual system parameters at reload, first perform a system dump of the actual system parameters of the currently connected Spirit DataCine film scanner!

4.6.3 ANALYZE SYSTEM DUMP



The dialog „Analyze system dump" allows to view and analyze all parameters of the SPIRIT DataCine film scanner out of a dump file on the PC's hard disk. To perform an analysis, you first have to select a filename from the upper frame's list field. It shows all the files in the SDCMAINT subdirectory SYSDUMP. After selection of a file, the description text and the date of the dump are shown in two message fields below of it.
Now the lower frame of the dialog window displays the data of one of the stored „Information fields". The data consists of the following items:

- **Field No.**
  The actual number and the total number of stored „Information fields"
- **Unit**
  The name of the controller which manages this „Information field"
- **Name**
  The name of the „Information field"
- **Keyword**
  The one-byte or two-byte keyword of the „Information field" in hexadecimal representation
- **Size**
  The number of bytes of data contained in this „Information field"
- **Data**
  The data bytes of the „Information field" in hexadecimal representation
- **Description**
  A short description text of the „Information field" (only if available)
- **pre-settable**
  A checkbox showing why the actual „Information field" is pre-settable or read only

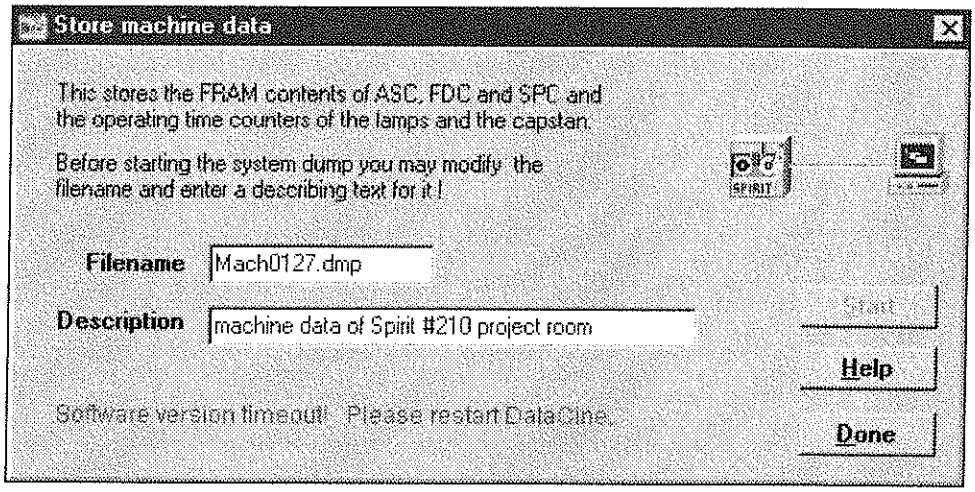
- **analog I/F**
  A checkbox showing why the actual „Information field" contains an analog value
- **Analog value**
  The decimal and percentile representation of an analog value

To move to another „Information field", you have different entry possibilities:

- press the button **>** to move to the next entry
- press the button **<** to move to the previous entry
- press the button **>>** to move to the first entry of the next controller unit or end of list
- press the button **<<** to move to the first entry of the previous controller unit or begin of list
- select an entry using the list box „Information field name"
- select an entry using the list box „Keyword"

At any time you can select another system dump file by selecting its name from the upper frame's list field. To close the dialog window, push the „Done" button at the lower right edge.

4.6.4 STORE MACHINE DATA


Store machine data
This stores the FRAM contents of ASC, FDC and SPC and the operating time counters of the lamps and the capstan.
Before starting the system dump you may modify the filename and enter a describing text for it !
Filename
Mach0127.dmp
Description
machine data of Spirit #210 project room
Start
Help
Software version timeout! Please restart DataCine.
Done

Machine data dumps are snapshots of the permanently stored alignments and configurations of a SPIRIT DataCine film scanner. They contain all the data stored in the non-volatile RAM of the machine. With the store machine data functionality it is possible to store and reload a specific alignment of the SDC2000. This function is only available with activated Service mode to prevent unwanted misalignments.

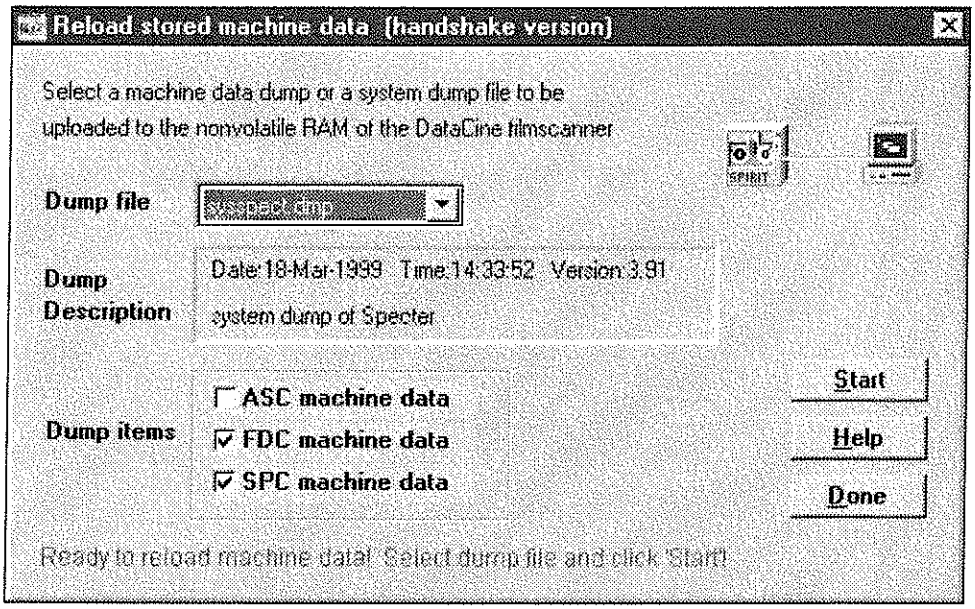
The dialog „Store machine data" allows to write all the actual non-volatile RAM parameters of the SPIRIT DataCine film scanner into a file on the Diagnosis PC's hard disk.

Before starting the system dump, you may modify the two entry fields of the dialog: the filename and the description text. A default filename is generated automatically as „MACHnnnn.DMP" where nnnn is a four-digit number, which is counted up with each completed dump. You can change this default filename by overwriting it with another standard DOS filename (8 characters name & 3 characters extension). The dump file will be stored in the subdirectory „SYSDUMP" of the SDCMAINT main directory. The description text can be any ASCII text and will be stored together with the system dump data. Additionally, the actual date and time are stored together with it.

When you push the „Start" button, the dump process starts and requests the special „Information fields" containing the non-volatile RAM data of the SPIRIT DataCine film scanner. The actual field name is displayed at the lower edge of the dialog. A dump will last some seconds. To close the dialog, push the „Done" button.

4.6.5 RELOAD MACHINE DATA

The dialog 'Reload machine data' allows to load the non-volatile RAM parameters of the SPIRIT DataCine film scanner out of a dump file on the PC's hard disk.

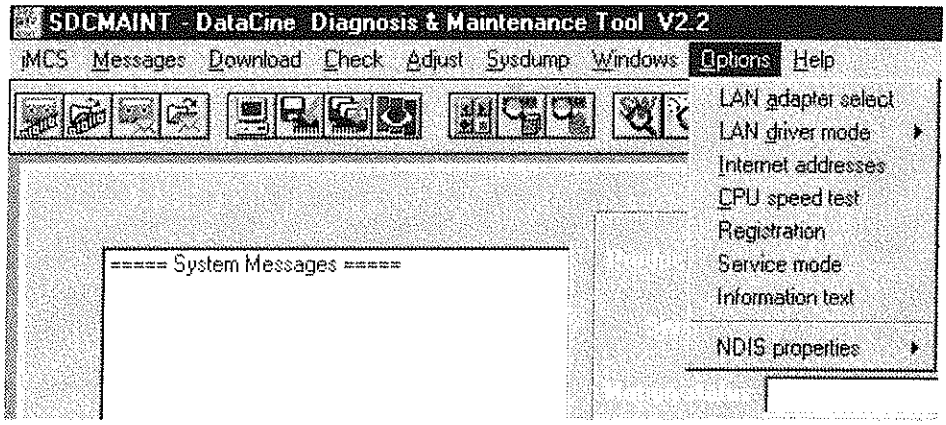

Reload stored machine data (handshake version)
Select a machine data dump or a system dump file to be uploaded to the nonvolatile RAM of the DataCine filmscanner
Dump file
Dump Description
Date:18-Mar-1999 Time:14:33:52 Version:3.91
system dump of Specter
Dump items
ASC machine data
FDC machine data
SPC machine data
Start
Help
Done
Ready to reload machine data! Select dump file and click 'Start'

To perform a reload, you have to select a filename from the list field „Dump file" which shows all the files in the SDCMAINT subdirectory SYSDUMP. After selection of a file, the description text, the date and time of the dump and the software version of the Spirit DataCine system are shown in the message field „Dump Description". In the checkbox field "Dump items", the machine data entries found in the dump file are selected automatically. Only the machine data items that are selected will be reloaded to the Spirit DataCine film scanner.

Now you can push the „Start" button to start the dump download. Two extra security request messages are shown, warning that you will overwrite the actual machine data parameters of your currently connected Spirit DataCine film scanner. If you acknowledge the security requests with „Yes", the reload starts. The actual field code is displayed at the lower edge of the dialog. A dump reload will last only about some seconds. To close the dialog, push the „Done" button.

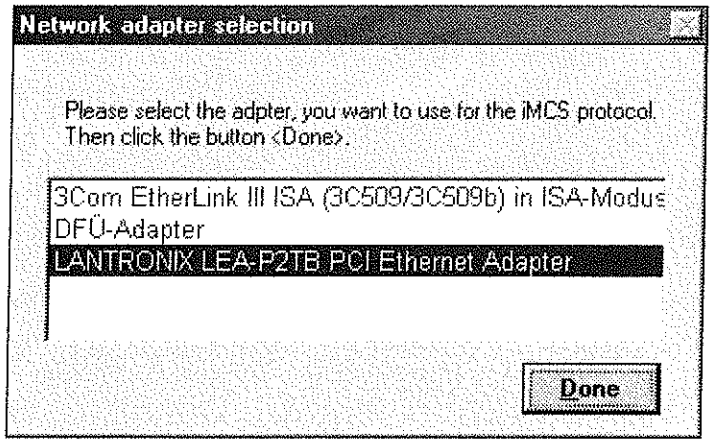
NOTE: To avoid the loss of the actual machine data parameters at reload, first perform a machine data dump of the actual system parameters of the currently connected Spirit DataCine film scanner!

4.7 PULLDOWN MENU „OPTIONS"



The items in the Options pulldown menu allow to view and modify some setup parameters of the SDCMAINT maintenance and diagnosis tool. These are the LAN driver modes, the CPU speed, the registration entries and the properties of the NDIS driver.

4.7.1 OPTIONS MENU ITEM "LAN ADAPTER SELECT"


Network adapter selection
Please select the adpter, you want to use for the iMCS protocol.
Then click the button <Done>.
3Com EtherLink III ISA (3C509/3C509b) in ISA-Modus
DFÜ-Adapter
LANTRONIX LEA-P2TB PCI Ethernet Adapter
Done

Here a list of all installed network adapter drivers is displayed. You must select the adapter which is connected to the Thomson DataCine.

REMARK: There may be listed inactive or not fully installed or deinstalled drivers in the list. These ones are not usable for SDCMAINT. The "Dialup adapter" or "DFÜ-Adapter" is not supported either.

4.7.2 OPTIONS MENU ITEM „LAN DRIVER MODE"

At this item, the actual LAN driver mode can be changed between

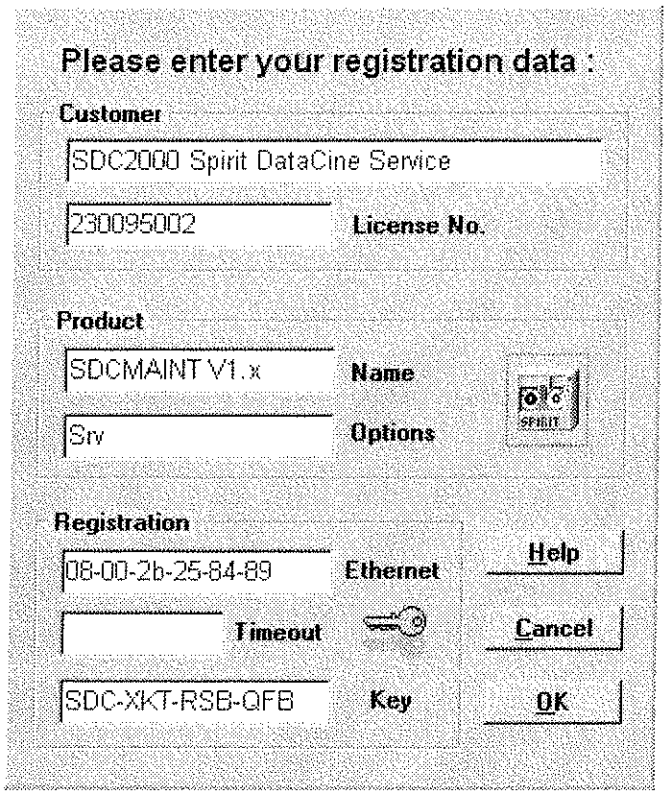
- „iMCS standard mode"
- „iMCS IEEE mode"
- „UP/IP mode"

by selecting the corresponding entry in the pulldown menu. The correct selection for the film scanner's internal diagnosis is the „iMCS standard mode". For Voodoo iMCS diagnosis use "iMCS IEEE mode".

4.7.3 OPTIONS MENU ITEM „CPU SPEED TEST"

This menu item starts the CPU speed test again, which was already performed during the startup of SDCMAINT. The calculated value is shown in a separate message window. This speed value is used to guarantee a reproducible timing for all PC types between 80386 and Pentium at software downloads.

4.7.4 OPTIONS MENU ITEM „REGISTRATION"



This dialog window allows to review or modify the entries in the registration database of SDCMAINT. These entries are the customer's name, the license number, the product name and options, the Ethernet address, perhaps a

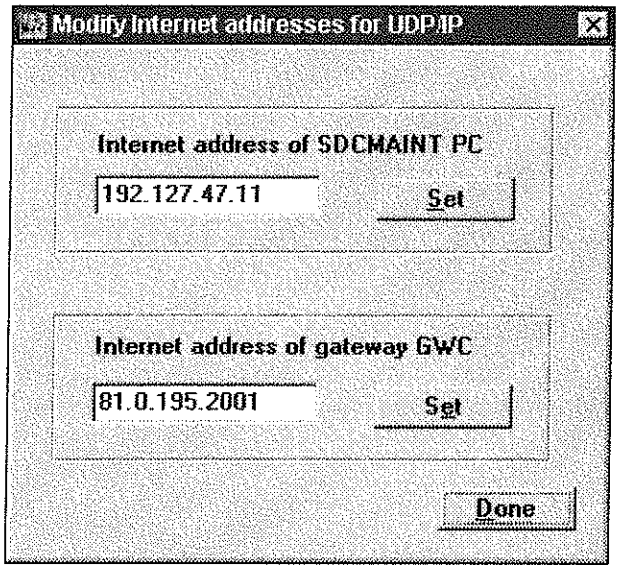
timeout date and finally a registration key word. This key word must match to all the other entries in order to have a valid registration data set.

The Options field may contain up to 3 options separated by a comma:

- **Tio**
  the given timeout date is activated
- **Eth**
  only the given Ethernet address is valid
- **Srv**
  service mode is activated by default

If you get new registration data from Thomson Multimedia, you can enter it into the different entry fields. When pushing the „OK" button, the key word is checked against the other entries and the data is stored in the file KEY.DAT if the registration is valid. If the data is not valid, you are requested to indicate why you want to keep the previous data without change. With an invalid registration key, it is not possible to start SDCMAINT once again.

4.7.5 OPTIONS MENU ITEM „INTERNET ADDRESSES"

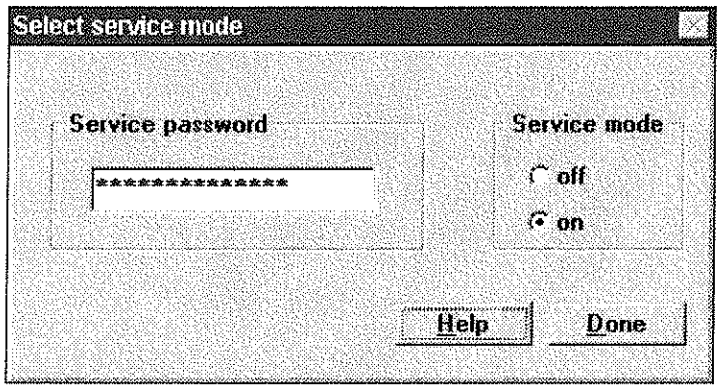


In this dialog, you can preset the Internet address of your diagnosis PC and the Internet address of the SDC 2000 Gateway Controller GWC.

The addresses must be set according to your company's guidelines to prevent any duplicate address in your local network.

NOTE!
These entries are only necessary if you want to use the LAN driver mode „UDP/IP".

4.7.6 OPTIONS MENU ITEM „SERVICE MODE“



This dialog allows to switch between the service mode and the non-service mode (customer mode) of the SDCMAINT Diagnosis tool. In order to switch on the service mode, the previous entry of a service password is necessary.
Only if the registration data is supplied with the additional option „Srv“, no service password is needed.
In the non-service mode, the functions „Send iMCS telegram“, „Download single unit“, Download complete system“ and „Monitor link“ are disabled. This is done to prevent any damages to the SPIRIT DataCine film scanner by erroneous modifications of the system parameters and software.

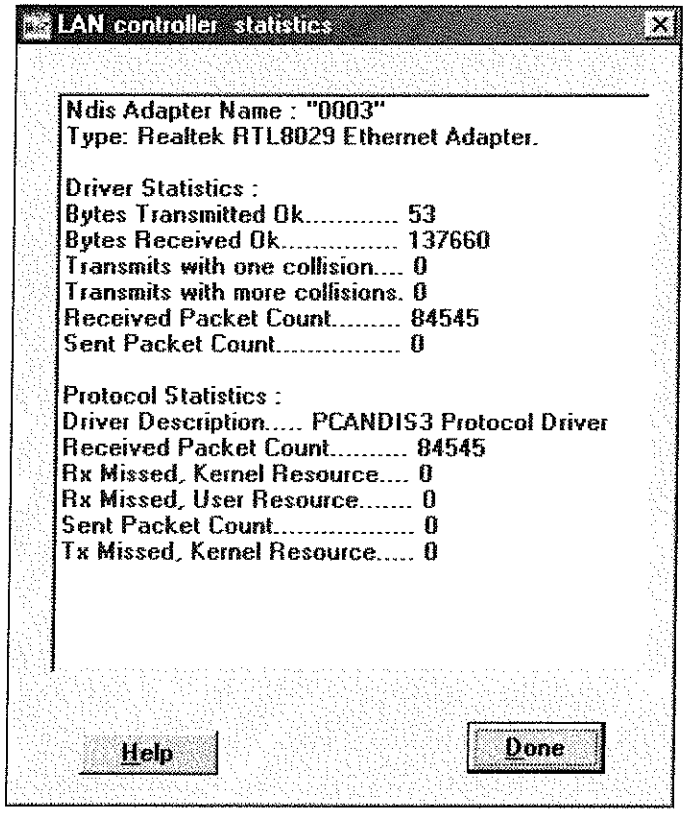
4.7.7 OPTIONS MENU ITEM „NDIS PROPERTIES“

The NDIS properties are some menu items to view and modify the configuration of the NDIS 2.01 link and the employed Ethernet card's controller. These functions are only applicable if something goes wrong with the NDIS link or there are problems with the Ethernet card used.

4.7.7.1 MENU ITEM „SOFTWARE STATE“

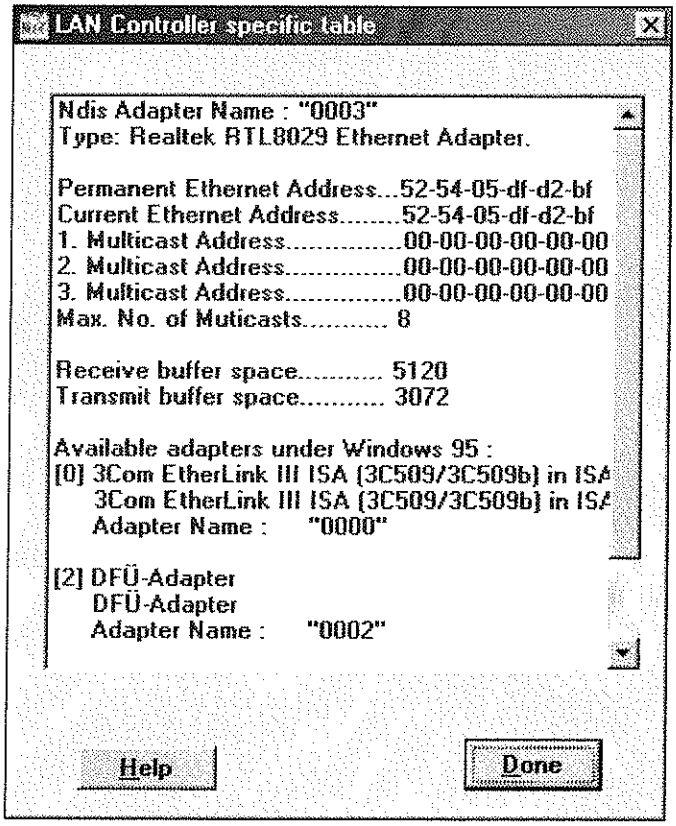
These are some internal counters of the SDCMAINT tool. The window is also a debugging screen for internal online diagnosis.

4.7.7.2 MENU ITEM „STATISTIC TABLE“



This menu item requests the LAN controller for the actual counters to build a statistic table. These are the current operation modes and the frame and byte-counters of the receiver and the transmitter. The number of occurred errors is also shown.
The list can be scrolled through using the scrollbar at the right side. The dialog can be closed by pushing the „Done“ button.

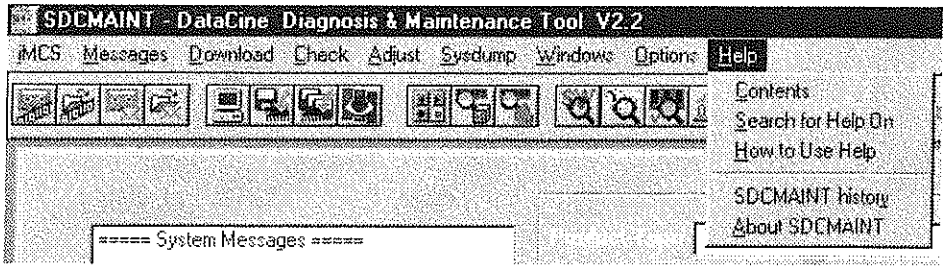
4.7.7.3 MENU ITEM „SPECIFIC TABLE“



This menu item requests the LAN controller for the actual configuration to build a specific table. These are the limitations of the LAN controller, the buffer sizes and the current Ethernet address settings of the receiver and the transmitter. The list can be scrolled through using the right scrollbar.

The dialog can be closed by pushing the „Done“ button.

4.8 PULLDOWN MENU „HELP“


SDCMAINT - DataCine Diagnosis & Maintenance Tool V2.2
MCS Messages Download Check Adjust Sysdump Windows Options Help
Contents
Search for Help On
How to Use Help
SDCMAINT history
About SDCMAINT
===== System Messages =====

This pulldown menu gives access to the online instructions supplied with the SDCMAINT diagnosis and maintenance tool. They are available in the separate file SDCMAINT.HLP. Additionally, the „About“ items give some information about the version and registration of the application.

4.8.1 MENU ITEM „CONTENTS“

This menu item opens the Help dialog at the main window from where you can branch to any interesting instruction text by selecting one of the hyperlinks.

4.8.2 MENU ITEM „SEARCH FOR HELP ON...“

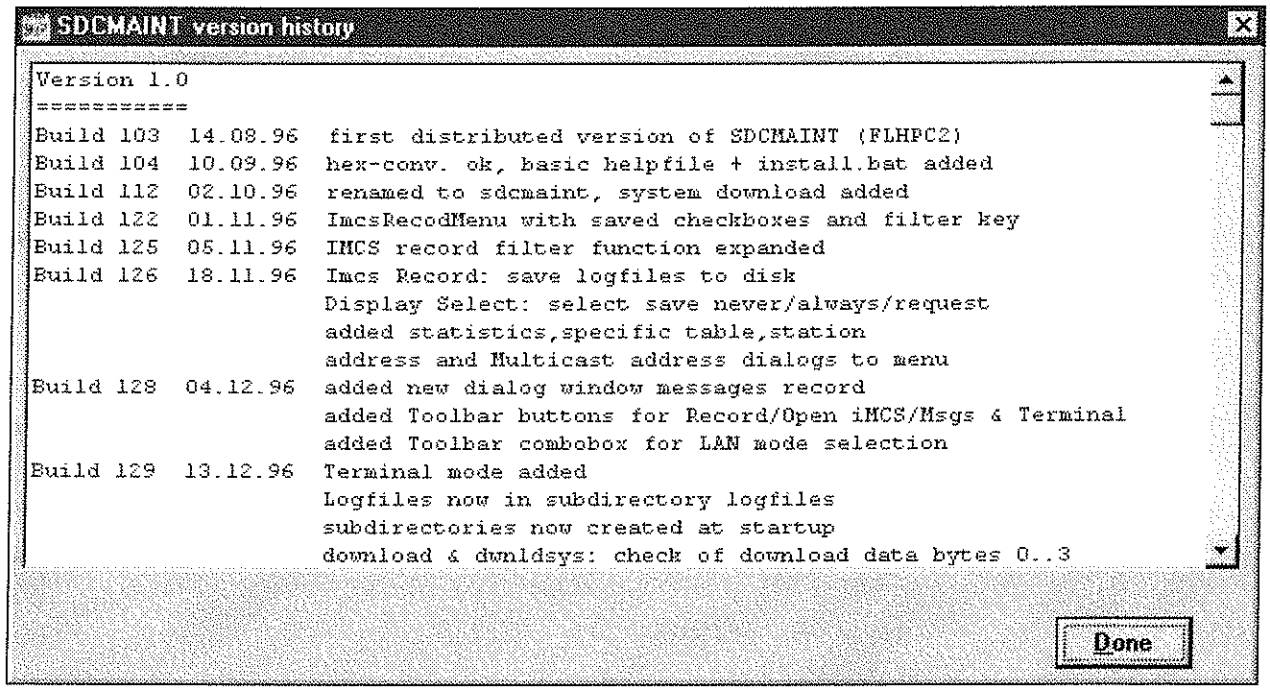
This menu item opens the Help dialog with a sorted keyword list where you can select an interesting instruction text by clicking the corresponding keyword.

4.8.3 MENU ITEM „HOW TO USE HELP“

This menu item opens a Windows internal Help dialog with common instruction how to use the Help dialog.

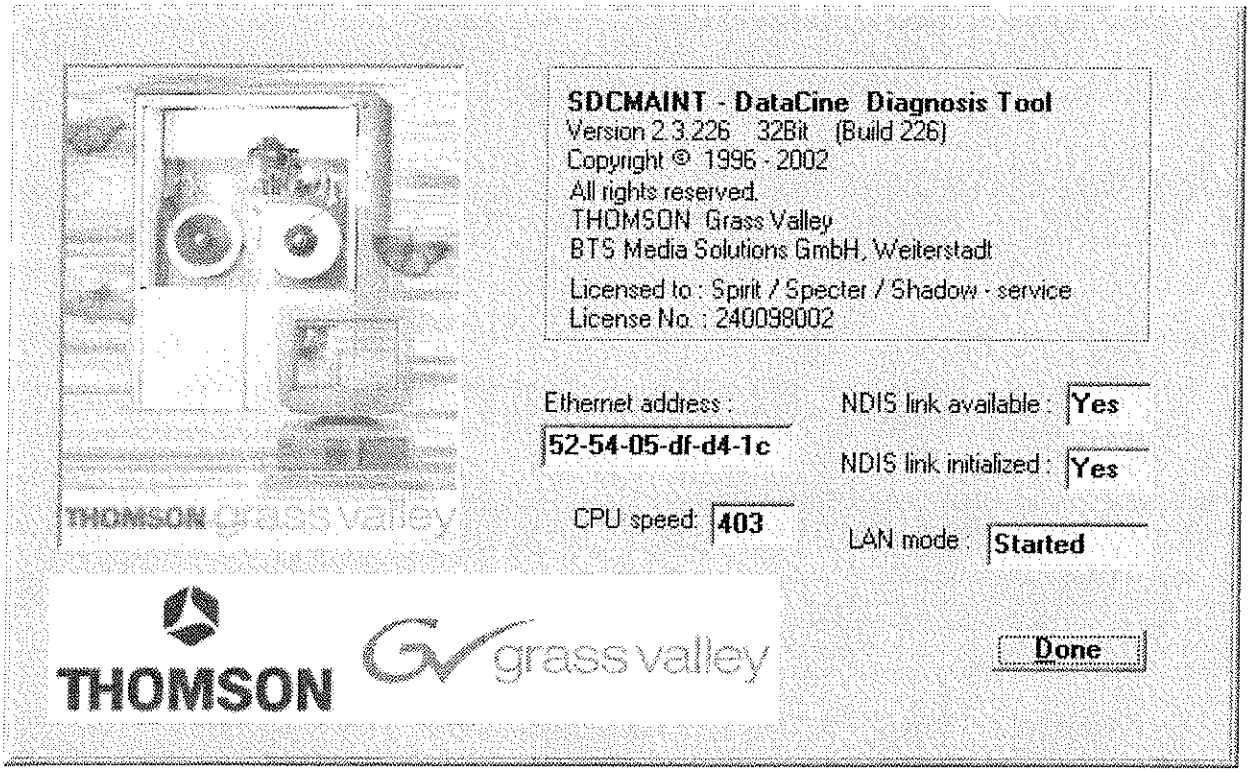
4.8.4 MENU ITEM „SDCMAINT HISTORY“

This menu item shows a list of all versions of SDCMAINT and the bug fixes and enhancements implemented at the different builds.


SDCMAINT version history
Version 1.0
==========
Build 103 14.08.96 first distributed version of SDCMAINT (FLHPC2)
Build 104 10.09.96 hex-conv. ok, basic helpfile + install.bat added
Build 112 02.10.96 renamed to sdcmaint, system download added
Build 122 01.11.96 ImcsRecodMenu with saved checkboxes and filter key
Build 125 05.11.96 IMCS record filter function expanded
Build 126 18.11.96 Imcs Record: save logfiles to disk
Display Select: select save never/always/request
added statistics,specific table,station
address and Multicast address dialogs to menu
Build 128 04.12.96 added new dialog window messages record
added Toolbar buttons for Record/Open iMCS/Msgs & Terminal
added Toolbar combobox for LAN mode selection
Build 129 13.12.96 Terminal mode added
Logfiles now in subdirectory logfiles
subdirectories now created at startup
download & dwnldsys: check of download data bytes 0..3
Done

4.8.5 MENU ITEM „ABOUT SDCMAINT"

This menu item provides some information on the SDCMAINT SPIRIT DataCine Diagnosis and Maintenance Tool itself, including the following items:



- version number
- copyright statement
- licensee's name
- license number
- detected Ethernet address
- detected CPU speed (in about nnn MHz of a Pentium®)
- availability of an NDIS driver
- initialization state
- actual running receive mode

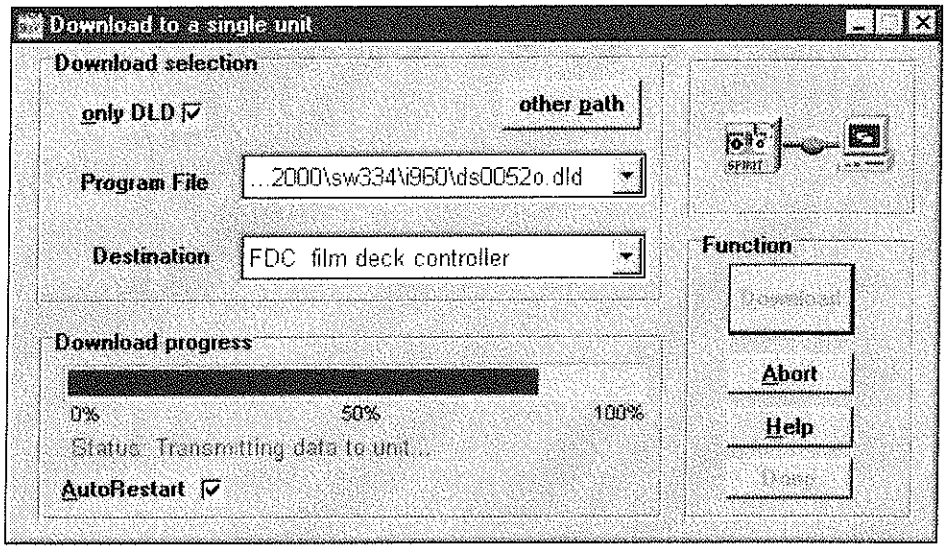
This dialog can be closed by pushing the „Done" button at the lower right corner.

5. TYPICAL OPERATIONS

5.1 LOAD THE NEW SDC 2000 CONTROLLER SOFTWARE FROM FLOPPY TO THE HARDDISK OF THE PC.

If you do not have already loaded the new SDC 2000 controller software onto your local hard disk, insert the floppy disk(s) or CDROM with the new software into the disk drive and start copying with the pulldown menu items „Download Copy & convert from A:/B:". All files with the extensions DLD, BIN and HEX will now be converted to the DLD format and stored into the directory C:\SDCMAINT\DOWNLOAD on the local hard disk.

5.2 START AND PERFORM THE DOWNLOAD FUNCTION OF SDCMAINT



If you have the new controller software available in the DOWNLOAD directory, you can start the download dialog via the pulldown menu item „Download Single unit". In the upper selection box, you can select one of the files from the DOWNLOAD directory to be downloaded to the SDC 2000.
In the lower selection box, you may select the appropriate unit for the selected software, but this selection is done automatically if the filename is the standard software version name provided by Thomson Multimedia. Now you can start the download by clicking the „Download" button.
Make sure that the SDC 2000 is previously switched to STOP and LOCAL mode (Remote mode off).
If only an upgrade of the application software of the units is necessary, you have to load the appropriate file to each unit:

DS0051x.DLD to ASC
DS0052x.DLD to FDC
DS0053x.DLD to GWC
DS0054x.DLD to SPC
DS0013x.DLD to FCP
(x is a subversion character beginning with „a")

If an upgrade of the application software and the system software of the units is necessary, you have to load first the system software and then the application software to each unit:

DS0050x.DLD to ASC
DS0051x.DLD to ASC
DS0050x.DLD to FDC
DS0052x.DLD to FDC
DS0050x.DLD to SPC
DS0054x.DLD to SPC
DS0013x.DLD to FCP (here the system software is firmware)

This download sequence can be automated by writing a correspondent script file and using the full system download via the pulldown menu item „Download Complete system".

5.3 ENABLE REMOTE CONTROL ACCESS WITH PC DUO FOR THOMSON SERVICE

Install PC-Duo on your PC according to chapter 2.1.2 „Installation of remote control software.."
Take care that the modem is switched on at PC startup and is connected to the telephone line. Now remote control access by Thomson service to your SPIRIT DataCine film scanner is possible. The following tasks can be performed:

- Sending new software versions to your Diagnosis PC
- Downloading this software to your SPIRIT DataCine film scanner
- Restarting the SPIRIT DataCine's controller software
- Collecting actual system messages of your Spirit DataCine
- Transmitting these logfiles to the Thomson service
- Performing a system dump of the SPIRIT DataCine to the Thomson service
- Transmitting this dump file to the Thomson service
- Sending special diagnosis script files to your Diagnosis PC
- Starting these diagnosis scripts
- Connecting the telecine's local diagnosis ports via "Monitor Link"

Please ask your Thomson Multimedia service engineer for farther details on the remote maintenance benefits.

6. INDEX

Abbreviations 4
Adjust
menu 52
message weighting 52
mini control panel 53
monitor link 54
real-time clock 53
restart all units 55
Analyze
system dump 58
Check
board versions 42
menu 14, 39
operating time 44
overview system check 45
software version 40, 42
Controllers 42
CPU
speed test 62
Diagnosis
terminal connection 11
Diagnostic Kit FH 1660 3
Download
complete system 12, 36, 69
edit script file 38
menu 28
single unit 12
single unit 35
Ethernet
address 63
card 4
Help
menu 66
iMCS
disable filter 14
display select 17
filter select 14
network 10
open logfile 20
print logfile 23
record new file 19
record traffic 11
save logfile 21
send logfile 22
iMCS
open logfile 11
Installation
PC DUO 7
SDCMAINT 5
Internet
address 63
LAN
driver mode 62
driver UDP/IP 63
Lookup tables 28
Menu
Adjust 52, 56
Check 39
Download 28
Help 66
iMCS 14
Options 61
Messages 23
menu 23
open file 25
print file 26, 27
record file 24
save file 26
NDIS
properties 64
Operation 69
Options
menu 61
Output LUT 33
PC Duo 3, 4, 7, 70
PC LAN cable 10
Pulldown menus 14
Registration 62, 63
key 10, 63
Remote Control 7
Access 70
SDCMAINT 5
Basic commands 50
Basic interpreter 49
connection to SDC 2000 8
toolbar 11
Service
mode 63, 64
password 64
PC 8
Software state 64
Specific table 66
Starting the application 10
Statistic table 65
System
check 12
check overview 12
dump 56
System messages
open log file 11
record new 11
Tasks of SDCMAINT 3
Text editor 21
Timeout date 63
VGA LUT 29
Year 2000 Compliance 3